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MINIMUM WAGES AND POVERTY: NEW EVIDENCE FROM DYNAMIC DIFFERENCE-IN-DIFFERENCES ESTIMATES

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ABSTRACT

Advocates of minimum wage increases have long touted their potential to reduce poverty. This study assesses this claim. Using data spanning nearly four decades from the March Current Population Survey, and a dynamic difference-in-differences approach, we find that a 10 percent increase in the minimum wage is associated with a (statistically insignificant) 0.17 percent increase in the probability of longer-run poverty among all persons. With 95% confidence, we can rule out long-run poverty elasticities with respect to the minimum wage of less than -0.129, which includes central poverty elasticities reported by Dube (2019). Prior evidence suggesting large poverty-reducing effects of the minimum wage are (i) highly sensitive to researcher's choice of macroeconomic controls, and (ii) driven by specifications that limit counterfactuals to geographically proximate states ("close controls"), which poorly match treatment states' pre-treatment poverty trends. Moreover, an examination of the post-Great Recession era — which saw frequent, large increases in state minimum wages — failed to uncover poverty-reducing effects of the minimum wage across a wide set of specifications. Finally, we find that less than 10 percent of workers who would be affected by a newly proposed $15 federal minimum wage live in poor families.

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1. Introduction

During the 85 years since the U.S. Supreme Court ruled that state minimum wage laws were constitutional (*West Coast Hotel Co. v. Parrish*, 300 U.S. 379, 1937), prominent advocates of minimum wage increases — from Presidents Franklin D. Roosevelt through Joseph R. Biden — have consistently touted their potential to reduce poverty.[1] Indeed, poverty reduction has been a central argument in support of the *Living Wage Now Act* and the *Raise the Wage Act*, each of which would more than double the Federal minimum wage from $7.25 to $15 per hour (House Bill 325; Senate Bill S.53).[2]

There are several channels through which minimum wage increases could reduce poverty. If minimum wage increases raise hourly wages paid to poor workers — without causing substantial adverse labor demand effects (Card and Krueger 1995; Cengiz et al. 2019)) — such hikes could raise family incomes and lift poor workers out of poverty (Bernstein and Sherholz 2014; Dube 2019).[3] In addition, if low-skilled labor markets are monopsonistic or characterized by search-related frictions (Card and Krueger 1995; Manning 2003), minimum wage increases could, in theory, increase employment and raise incomes among the working poor. Moreover, if minimum wage hikes boost spending among low-skilled workers, who typically have a high marginal propensity to consume, minimum wage hikes could stimulate aggregate demand and generate longer-run economic growth that lifts some poor workers out of poverty (Congressional Budget Office 2021).

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[1] In West Coast Hotel Co. v. Parrish (300 U.S. 379 (1937)), the U.S. Supreme Court upheld the first state minimum wage law, stating that states could regulate wages to "reduce the evils of the 'sweating system', the exploiting of workers at wages so low as to be insufficient to meet the bare cost of living." With respect to U.S. Presidents and leading Senators, such rhetoric began with Franklin Roosevelt's advocacy for the *Fair Labor Standards Act* and continuing through President Biden's support for the *Raise the Wage Act*. To take a handful of examples, President John F. Kennedy stated, "The fiscal burden of an inadequate minimum wage law lies upon the community…We can no longer tolerate growing patches of poverty and injustice in America" (1961); President Lyndon B. Johnson stated, "The new minimum wage…will bring workers and their families a little bit above the poverty line, $3,000 a year. It will help them carry on. It will help them to not worry about three meals a day. It will enable them to help themselves develop skills so that they can someday earn more" (1966), Senator Edward Kennedy stated, "The minimum wage was, as it should be, a living wage, for working men and women . . .who are attempting to provide for their families, feed and clothe their children, heat their homes, [and] pay their mortgages" (1989); President Bill Clinton stated, "I've studied the arguments and the evidence for and against a minimum wage increase…But the most important thing is, you can't make a living on $4.25 an hour." (1996); President Barack Obama stated, "In the richest nation on earth, nobody who works full-time should have to live in poverty" (2014); and finally, President Joseph R. Biden, in 2020, stated, "No one should work 40 hours a week and live below the poverty wage. And if you're making less than $15 an hour, you're living below the poverty wage."

[2] The *Living Wage Now Act*, reintroduced by Congressman Steve Cohen (D-TN) in January 2023, would raise the Federal minimum wage immediately, while the *Raise the Wage Act of 2021* would phase in a Federal minimum wage hike over five years as well as eliminate the "tip credit" and several other coverage other exemptions.

[3] Some have further argued that by reducing poverty, an unintended public budget-related benefit of minimum wage increases may be a reduction in low-skilled workers' dependence on means-tested public assistance programs such as the Supplemental Nutrition Assistance Program (West and Reich 2015).

On the other hand, if low-skilled labor markets are competitive, minimum wage increases could reduce employment and work hours among low-skilled workers (Stigler, 1946, Clemens and Wither 2019; Clemens and Strain 2021; Neumark and Shirley 2021). If these employment losses are felt by some poor and near-poor workers, family incomes could fall, thereby plunging some low-skilled workers into (deeper) poverty (Neumark and Wascher 2002; Burkhauser and Sabia 2007; Sabia and Burkhauser 2010). Additionally, if minimum wage hikes impact output prices, particularly for products that poor individuals are more likely to purchase, then the effects of minimum wage hikes may be quite regressive (MaCurdy 2015).

Therefore, the net impact of minimum wage increases on poverty largely depends on (1) wage, employment, and hours elasticities with respect to the minimum wage, (2) the distribution of earnings gains and losses for poor and near poor workers, and (3) spillover effects of the minimum wage on output prices and spending-induced longer-run economic growth.[4]

Despite significant disagreement among labor economists over the employment effects of U.S. minimum wage increases (Neumark and Shirley 2021; Cengiz et al. 2019; Clemens and Wither 2019; Neumark, Salas, and Wascher 2014; Dube et al. 2010), there had largely been a consensus among labor economists that minimum wage increases did little to reduce poverty (Sabia and Burkhauser 2010; Burkhauser and Sabia 2007; Neumark and Wascher 2002; Card and Krueger 1995). This consensus was owed to low rates of minimum wage labor supplied by individuals living in poor families (Card and Krueger 1995), and the diminished association between an individual earning a low wage and living in a poor family (Stigler 1946; Burkhauser and Sabia 2007).[5]

However, the consensus among labor economists that the minimum wage serves as an ineffective anti-poverty tool has been broken. A highly influential study by Dube (2019) finds that minimum wage increases enacted in the 1980s, 1990s, and 2000s were associated with statistically significant and *economically substantial* declines in poverty. Using data from the March 1984-2013 Current Population Surveys (corresponding to calendar years 1983-2012) and a variety of difference-in-differences approaches, Dube (2019) estimates contemporaneous poverty elasticities with respect to the minimum wage of -0.2 to -0.5 for non-elderly individuals (those ages 0-to-64) as well as longer-run (three years or more) elasticities as large as -0.9 for racial/ethnic minorities. The largest

[4] In addition, poverty could be indirectly impacted by the effects of minimum wages on the prices of goods in the market basket that determines the poverty threshold or on economic growth (CBO 2021).

[5] Moreover, Neumark and Wascher (2002) further argued that while increases in wages of some poor workers would lift them (and their family members) out of poverty, adverse employment and hours effects among other near-poor workers would reduce their income, plunging them (and their family members) into poverty.

poverty elasticities are found in regression models that force geographically proximate counterfactuals (via the inclusion of controls for census division-specific year effects), also include controls for state-specific linear time trends, and further include a full set of state-by-year dummy interactions for the years 2007, 2008, and 2009.

Dube's highly influential study has been cited in a Congressional Budget Office report (CBO 2019) assessing the impact of the minimum wage on the distribution of family incomes, an important component of a later CBO report (CBO 2021) projecting 900,000 individuals would be lifted out of poverty from an increase in the Federal minimum wage from $7.25 per hour to $15 per hour. Dube (2019) has also been frequently cited in Congressional testimony in support of raising the Federal minimum wage (Reich 2019; Shierholz 2021).

This study revisits the relationship between minimum wage increases and poverty. We highlight four key results. First, we replicate and reassess the findings of Dube (2019), based on poverty data from the March 1984 to March 2013 CPS (corresponding to calendar years 1983-2012). After precisely replicating his estimates, we show that his results are driven by two specification choices: (1) the inclusion of macroeconomic controls (the state unemployment rate and per capita state Gross Domestic Product) that *may also capture a mechanism through which the minimum wage affects poverty*: its employment and hours effects, and (2) restricting treatment states' counterfactuals to states within the same census division ("close controls"), even when geographically proximate states are rejected by a data-driven synthetic control approach to generate counterfactuals. When we (1) use the state house price index and the unemployment and average wage rate among more highly educated individuals to control for state macroeconomic conditions that are less likely to capture pathways through which minimum wages affect poverty in a difference-in-differences framework, or (2) allow states outside a treatment state's census division to serve as potential donors in a synthetic control framework, we find no evidence of poverty-reducing effects of the minimum wage over the 1983-2012 period. Moreover, neither event-study analyses based on the full distribution of minimum wage increases nor based on prominent minimum wage increases ($1.00, $0.75, and $0.50 per hour per year) using Callaway and Sant'Anna (2021) estimates show evidence that raising the minimum wage was an effective strategy to reduce poverty during the 1983-2012 period. The 95 percent confidence intervals around our preferred estimates rule out poverty elasticities with respect to the minimum wage of less than -0.138, which include central estimates reported by Dube (2019).

Second, when we explore the most recent decade of CPS data, which captures the years following the Great Recession (2010-2019), the contemporaneous and longer-run poverty findings

reported by Dube (2019) are largely absent, including in models that use Dube's preferred macroeconomic controls or controls for spatial heterogeneity. Specifically, we find no evidence that post-Great Recession minimum wage increases had a statistically significant or economically important effect on poverty. This result is robust across alternative poverty measures (i.e., Official Poverty Measure vs. Supplemental Poverty Measure), over the family or household income-to-needs distribution, across specifications that include (or exclude) state-specific linear time trends and census division-specific year effects, across demographic groups (all individuals, non-elderly individuals, working-age individuals, less-educated or less-experienced persons, single mothers, children, and Black and Hispanic individuals) as well as using newly-developed dynamic difference-in-differences approaches (Schmidheiny and Siegloch 2019; Callaway-Sant'Anna 2021), including event-study analyses of prominent minimum wage increases. Again, the 95 percent confidence intervals around our estimated minimum wage effects rule out the central poverty elasticities reported by Dube (2019).

Third, when we combine the two data windows discussed above and amass our "full panel" from 1983-2019, we find little support for the hypothesis that minimum wage increases reduce poverty over this 37-year period. Estimated elasticities below -0.131 for non-elderly individuals (and below -0.129 for all persons) lie outside of our 95% confidence interval, which would rule out the central long-run estimate reported by Dube (2019). Our preferred estimate shows that a 10 percent increase in the minimum wage is associated with a (statistically insignificant) 0.17 percent increase in the probability of poverty among all persons.

Finally, we find that raising the Federal minimum wage to $15 per hour, as proposed in the *Living Wage Now Act* and *Raise the Wage Act*, is a poorly targeted means of delivering income to the working poor. We find that less than 10 percent of those whose hourly wage rate would be directly impacted by a $15 minimum wage live in poor families. Approximately two-thirds live in families with incomes over two times the poverty line and nearly half live in families with incomes over three times the poverty line. In summary, our findings provide little compelling evidence that raising the minimum wage will be an effective or target efficient policy tool for alleviating poverty.

2. Background

Among the most direct channels through which the minimum wage can affect the probability that an individual lives in poverty include its effects on wages, employment, and work hours. While there is little disagreement that minimum wage increases cause an increase in wages

among less-educated and less-experienced workers (Neumark and Wascher 2008), there is substantial disagreement among labor economists as to the magnitude of low-skilled employment and hours effects of U.S. minimum wage increases (Neumark and Shirley 2021; Clemens and Strain 2021; Clemens and Wither 2019; Cengiz et al. 2019; Neumark et al. 2014; Allegretto et al. 2011; Dube et al. 2010).[6] Despite such disagreements, a consensus had emerged that minimum wage increases were ineffective at reducing poverty (Card and Krueger 1995; Neumark and Wascher 2002; Sabia and Burkhauser 2010; MaCurdy 2015; Clemens and Wither 2019).[7] This consensus has been attributed to low rates of employment among those living in poor and near-poor families (Card and Krueger 1995) as well as the fact that a non-trivial share of those who are employed in such families already have hourly wage rates above the proposed minimum wage increases. (Burkhauser and Finegan 1989; Burkhauser et al. 1996).[8,9]

[6] Differences in findings across studies can be attributed to a number of interrelated factors, including (1) heterogeneous impacts of minimum wage increases across time, jurisdictions, macroeconomic conditions, the size of minimum wage increases, and aggregation of low-wage workers, (Neumark et al. 2021; Clemens and Strain 2021), (2) researchers' choice of empirical strategies to disentangle employment effects of minimum wage increases from the effects of other correlated factors, including contemporaneous local macroeconomic shocks and social welfare policies, (3) the credibility of limiting counterfactuals to jurisdictions that are geographically proximate ("close controls") (Dube et al. 2010; Allegretto et al. 2011; Neumark et al. 2014), and (4) how to best address the potential for policy endogeneity without obscuring dynamic employment effects of the minimum wage (Allegretto et al. 2011; Neumark et al. 2014; Meer and West 2016). Relatedly, differences in the source of identifying variation across state and federal minimum wages changes may also be important (Burkhauser et al. 2000; Clemens and Wither 2019). See also Sabia et al. (2012; 2016) for an example of a case study of a state minimum wage hike that demonstrates evidence of potentially large negative employment responses to minimum wage increases.

[7] See also Burkhauser and Sabia (2007) and Sabia and Nielsen (2015). Sabia et al. (2018) find evidence of a redistribution of poverty following an increase in the minimum wage paid to tipped employees. Addison and Blackburn (1999) is a notable exception. While they find that minimum wage increases have little effect on overall poverty rates, they find some evidence of poverty reduction among teenagers and young adult dropouts.

[8] In addition, to the extent that minimum wage hikes do induce negative employment effects, the net effects of minimum wages will reflect income redistribution among poor and near-poor workers (Neumark and Wascher 2002). In addition, there is evidence that minimum wage increases have regressive distributional effects (MaCurdy 2015) through their effects on output prices (Aaronson 2001; Aaronson and McDonald 2008). MaCurdy (2015) concludes that "…an increase in the national minimum wage produces a value-added tax effect on consumer prices that is more regressive than a typical state sales tax and allocates benefits as higher earnings nearly evenly across the income distribution. These income-transfer outcomes sharply contradict portraying an increase in the minimum wage as an antipoverty initiative." (MaCurdy 2015, p. 497).

[9] A separate, but related literature on minimum wages and poverty has focused on the target efficiency of the minimum wage (Stigler 1946; Burkhauser et al. 1996; Burkhauser and Sabia 2007). Stigler (1946) argued that the relationship between earning a low hourly wage and living in poverty is "fuzzy" because an individual's poverty status depends not only on her wage rate, but also on the size of the resource sharing unit to which she belongs, the earnings of other members of the sharing unit, and the hours of low-wage labor worked by workers in the household. Burkhauser et al. (1996) show that while the minimum wage used to be well-targeted to workers in poor households (i.e., in 1939, 85 percent of low-wage workers lived in poor households), the relationship between a low hourly wage rate and living in poverty became more remote as the decades passed. In 1939, when most families were characterized by a single "breadwinner," approximately 85 percent of low-wage workers lived in poor households. Over the next several decades, as second- and third earners in households rose, driven by large increases in female labor force participation, the share of low-wage workers living in poor households plummeted to under 20 percent (Burkhauser and Sabia 2007).

However, a highly influential study by Dube (2019) offers a direct challenge to the consensus that minimum wage increases fail to reduce poverty. Using poverty data from the 1983-2012 CPS and a difference-in-differences (DD) approach, Dube (2019) estimates longer term (three years or more) poverty elasticities with respect to the minimum wage of -0.22 to -0.47 for non-elderly individuals. Estimated elasticities reach as large as -0.53 for individuals without a high school degree and -0.87 for Blacks and Hispanics.[10] Poverty-reducing effects of the minimum wage are somewhat larger (in absolute magnitude) when estimating the policy's impact on the probability that an individual lives in "deep poverty," defined as living in a family with income less than 50 percent of the federal poverty threshold. Intriguingly, Dube poverty elasticities are approximately twice as large in regression models that force geographically proximate counterfactuals (via the inclusion of controls for census division-specific year effects), also include controls for state-specific linear time trends, and further include a full set of state-by-year dummy interactions for the years 2007, 2008, and 2009.[11] While Dube (2019) prefers specifications to be saturated with the above spatial heterogeneity controls, he avoids taking a stand on these controls by also producing a significant poverty elasticity with respect to the minimum wage in a "canonical" two-way fixed effects (TWFE) model. In Table 7, column 1 (p. 299), Dube (2019) employs a TWFE model and estimates a longer-run poverty elasticity of -0.22. This shattering of a previously held consensus — across a variety of specifications preferred by researchers on each side of the employment debate — is a stunning development in this literature, one worthy of further reassessment and reconciliation with prior studies' null findings. Moreover, from a policy perspective, it is critical to explore whether the relationship captured by Dube (2019) during the 1980s, 1990s, and 2000s persists during the economic expansion of the 2010s and is robust to new developments in dynamic difference-in-differences literature (Goodman-Bacon 2021; Cunningham 2021; Sun and Abraham 2021).

[10] To measure poverty Dube (2019) uses a slightly modified version of the Official Poverty Measure (OPM) that disaggregates primary and secondary families. In a second approach, he directly examines family income, but augments his definition of family resources to include "the value of some noncash transfers (SNAP, housing assistance, school lunch) and refundable tax credits (EITC, child tax credit, and additional child tax credit)" but does not subtract taxes or the value of necessary expenditures (i.e., work-related transportation expenses, child support, and taxes) in calculating total resources as in the Supplemental Poverty Measure (SPM).

[11] Perhaps this finding is not surprising given that the first two sets of controls for spatial heterogeneity (state-specific linear time trends and census division-specific year fixed effects) have also been shown to substantially reduce evidence of adverse employment effects of minimum wages (Neumark et al. 2014). Moreover, while Dube (2019) argues for interacting state fixed effects with the three calendar years in which the Great Recession took place, such controls will also net out (short- and medium-run) adverse employment effects of the 2007-2009 federal minimum wage increase (Clemens and Wither 2019).

In undertaking these tasks, we make several contributions. First, we replicate and reassess the findings of Dube (2019) and, in doing so, attempt to reconcile his findings with those of the prior literature. This will involve assessing: (1) how to appropriately disentangle the effects of minimum wage increases from the effects of state macroeconomic conditions *while at the same time* avoiding "over-controlling" for mechanisms through which the minimum wage could affect poverty (i.e. low-skilled employment and hours effects), (2) whether limiting counterfactuals to "close controls" is appropriate, and (3) whether the minimum wage's impact on poverty is affected by the magnitude of the increase (Clemens and Strain 2021). Second, we bring to the minimum-wage poverty literature, for the first time, dynamic difference-in-differences approaches that decompose the estimated treatment effect over time (Schmedheiny and Siegloch 2019) as well as excise bias in TWFE models that may be introduced by heterogeneous and dynamic poverty effects (Goodman-Bacon 2021; Callaway and Sant'Anna 2021).

Finally, we provide new estimates of the effects of minimum wage increases adopted during the entire post-Great Recession business cycle (2010-2019), as Dube (2019)'s analysis ends in 2012. Such analyses may generate important insights into the poverty effects of frequent, large state minimum wage increases enacted during a period of macroeconomic recovery. There were over 100 year-over-year increases in effective state minimum wages, averaging between $0.30 and $0.80 per year, with approximately 20 percent of real increases (above a nominal rate of ~2.5 percent over this period) totaling over $1 per hour per year.[12] On the one hand, minimum wage increases enacted during an economic expansion may be more likely to generate income gains and poverty reductions than in periods of economic recession if adverse employment effects were muted (Addison et al. 2013; Sabia 2014). On the other hand, larger minimum wage increases may be accompanied by large adverse employment effects (Clemens and Strain 2021), resulting in a redistribution of poverty rather than a reduction in poverty.[13]

[12] The frequency and magnitudes of these increases were calculated using the effective state minimum wage, averaged over the calendar year (i.e., if there were a mid-year change in the minimum wage). There were approximately 40 state legislated minimum wage increases, approximately 40 percent of which totaled $2 per hour (across all years of implementation). The frequency of these state increases was approximately 75 percent higher than in 1998-2006, the period between the last two Federal minimum wage increases (enacted between 1996-1997 and 2007-2009), and the average magnitude (in real terms) 37 percent larger.

[13] Moreover, the target efficiency of the minimum wage has neared a 25-year-peak, with poor workers poised to achieve greater gains from minimum wage increases than in prior years (Lundstrom 2017).

3. Context, Replication, and Reassessment

3.0 Context

Our analysis begins by drawing data from the March 1984-March 2013 CPS, which includes information on the poverty status of individuals for calendar years 1983-2012. Following Dube (2019), our primary analysis sample is comprised of non-elderly individuals ages 0-to-64. Dube's primary measure of poverty is the Official Poverty Measure (OPM), first established by President Lyndon B. Johnson. OPM thresholds are provided in the CPS and are calculated by the federal government as three times the cost of a minimum food diet in 1963 and adjusted by age, family size, and the annual national inflation rate (via the Consumer Price Index).[14]

The OPM uses the family — those related by blood, marriage, or adoption — as the resource sharing unit in calculating whether an individual lives in poverty. Total family resources are calculated as the sum of market income (labor earnings, rents, pensions, social security payments, dividends, and interest) and cash transfers received by each person living in the family. The income-to-needs ratio (INR) is calculated as the ratio of family income to the family size-specific and age composition-adjusted federal poverty threshold. Individuals in a family are deemed to live in poverty if total family income falls below the official poverty threshold (INR < 1.0).[15] Appendix Table 1 shows means of poverty rates across demographic groups for the period 1983-2012 (Panel I), and then from two additional periods we will examine below, the Post-Great Recession Era, 2010-2019 (Panel II), and the full 37-year panel, 1983-2019 (Panel III).

We collect state-by-year data on the effective state minimum wage using data collected by the U.S. Department of Labor (2021) and Vaghul and Zipperer (2019). Following Dube (2019), our key policy variable, *Min Wage*, is coded as the natural log of the higher of the federal or state minimum wage. Appendix Figure 1 shows time series trends in the effective minimum wage and poverty rate for all individuals and Appendix Figure 2 describes the frequency and average magnitude of state minimum wage increases.

Before replicating Dube's key regression estimates, we first assess the extent to which minimum wage increases could be expected to substantially reduce poverty over the 1983-2012 period. We do so by focusing on the relationship between the employment (or hourly wage rates) and poverty among the population of individuals on which Dube (2019) focuses in his main

[14] In 2019, the OPM threshold for a family of four with two children under age 18 was $25,926 (US Census Bureau 2021).

[15] We also include single-person families in our sample, assessing whether they live in poverty using the OPM threshold.

regressions: non-elderly individuals. This is to assess how likely it is that a minimum wage increase would impact an individual living in a poor family. In Figure 1, we show the poverty rate for eight categories of non-elderly individuals: those who (1) worked at least one week for at least one hour in a given year, (2) were steadily employed in a given year (≥ 10 hours per week for at least 10 weeks last year), (3) were non-workers (annual hours = 0), (4) were full-time-full-year workers (≥ 35 hours per week and ≥ 50 weeks per year), (5) were minimum wage or near-minimum wage workers[16], (6) worked and earned an hourly wage between $0.50 and $2.00 above the binding state minimum wage (which is larger than almost all year-over-year state minimum wage increases over the 1983-2012 period), (7) worked and earned an hourly wage $2.00 to $4.99 above the binding state minimum wage, and (8) worked and earned an hourly wage more than $5.00 above the binding state minimum wage.

Based on the likelihood that these individuals were living in a poor family (in a given year between 1983-2012), we draw three conclusions. First, from the first four columns: non-elderly individuals who do not work (or do not steadily work) have a poverty rate that is more than three times higher than those who do work (24 percent vs 7 percent), with steady workers and full-time, full-year workers having the lowest poverty rates (ranging from 2 to 6 percent). Second, from column (5), the vast majority — 83 percent — of those who were employed and earned the minimum wage (or just above the minimum wage) during the 1983-2012 period were not poor. Thus, minimum wage increases were unlikely to be a target efficient means of delivering income to the working poor. Third, from columns (6) through (8), those whose wage rates were above most minimum wage increases over the sample period (from $0.50 to $5.00) were even less likely to live in poor families. Moreover, when we examine the average share of family income that was earned in jobs near the minimum wage for non-elderly individuals living in poverty, we find that just 14.1 percent was earned from minimum wage jobs (not shown in the figure). Together, these descriptive statistics suggest, minimum wage increases enacted over the 1983-2012 period had relatively modest scope to reduce poverty over the sample period.

In Table 1, we provide additional descriptive information on this point. In panel I, we examine working-age individuals (ages 16-to-64) sampled over the 1983-2012 period who were living in families with INR < 0.50 (row 1), INR between 0.50 and 0.99 (row 2), INR of between 1.00 and 1.49 (row 3), and INR of 1.50 or greater (row 4). In turn, we explore the share of individuals in each

[16] We define a minimum wage worker as a worker who earned an hourly wage rate between $0.25 below and $0.50 above the current binding state minimum wage rate (the higher of the state or federal minimum wage).

INR category who are employed (column 1) and steadily employed (column 2), employed and earning a low wage (less than half of the average wage), employed and earning the minimum wage (column 5). In addition, we also explore unconditional annual work hours (column 3) and annual work hours among minimum wage workers (column 6). Our results show that working-age individuals living in families in deep poverty (INR < 0.50), poverty (INR < 1.0), or near poverty (INR between 1.00 and 1.49 are far less likely to be employed than those living in families with INR of 1.50 or greater. Among those living in deep poverty (INR < 0.50), just over a third of these (34.9 percent) working-age individuals were employed at all during the year (annual hours > 0) (column 1) and just 26.4 percent were steady workers (column 2). Larger shares of working-age individuals who lived in families with INRs between 0.50 and 1.0 (52.6 and 46.9 percent) were workers or steady workers. Employment and steady employment continue to rise for the near poor but are still substantially below rates for those living in families with INR ≥ 1.5. Furthermore, working age individuals living in poor families work, on average, 330 to 684 hours per year. Low rates of employment and low levels of work hours are potentially important reasons why minimum wage increases are not likely to be especially effective at reducing poverty (Card and Krueger 1995)

Historically, labor unions have argued that fairness to the working poor demands that the minimum wage should not be set to a value of less than the median wage.[17] When we examine the share of working-age individuals living in families in deep poverty, poverty, or near poverty, we find that only 24.7 to 33.0 percent of such individuals earn low wage rates, defined as less than half of the average wage in each year over the sample period (column 4). Thus, even if the minimum wage would have been raised to half of the average private sector wage ($11.04 over the sample period, in 2019$), the vast majority of working-age individuals living in poor or near poor families would not have been affected.

Moreover, most low-wage workers living in poor and near poor families were not directly affected by minimum wage increases enacted over the sample period. Among those working-age individuals living in deep poverty, poverty, and near poverty, only about 8 to 10 percent are minimum wage workers (column 5). Among that small share of working-age individuals who earn

[17] See, for example, the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO), which has argued that:

> ''Fairness to the working poor demands that the federal minimum wage should not be less than 50 percent of average hourly earnings of non-supervisory workers and production workers in the non-farm private economy'' (AFL-CIO Reviews the Issues, 1995).

wages at or near the minimum wage, annual work hours are about 930 to 1,395 per year, again limiting the scope with which minimum wage increases could reduce poverty, even in the absence of adverse employment effects.

Our findings in panel I of Table 1 are not unique to use of the household or the family as the resource sharing unit.[18] In panel II of Table 1, we use the household rather than the family as the resource sharing unit and (i) use household income as our measure of pooled resources, and (ii) adapt family poverty thresholds to household thresholds. Consistent with panel I, we find that just 7 to 9 percent of working-age individuals living in poor or near poor households have any minimum wage workers residing in them, and levels of annual minimum wage labor supply are more consistent with part-time or part-year work than full-time work.[19] Thus, the findings in panel II suggest that minimum wage increases are even more poorly targeted to working-age individuals living in poor households or near poor households than they are to workers in poor or near poor families and further suggest limited scope for minimum wage increases to drive large reductions in poverty (Card and Krueger 1995; Sabia and Burkhauser 2010).

3.1 Replication and Extension of Dube (2019)

We next replicate the two-way fixed effects (TWFE) model used by Dube (2019), estimated via ordinary least squares (OLS):

$$Poverty_{ist} = \beta_0 + \beta_1 MinWage_{st} + \mathbf{X_{ist}}\boldsymbol{\beta_2} + \alpha_s + \tau_t + \varepsilon_{ist} \quad (1)$$

where *i* indexes the individual, *s* the state of residence, and *t* the calendar year. $Poverty_{ist}$ is an indicator for whether person i lives in a family with income below (a particular multiple) of the federal poverty threshold, $MinWage_{st}$ is, following Dube (2019), the natural log of the higher of the state or Federal

[18] One concern over the OPM is that it is does not account for resource sharing among unrelated individuals residing in the same household (i.e., roommates, cohabiting couples, friends, and prior to 2015, many gay and lesbian couples) (Burkhauser et al. 2021).

[19] Appendix Table 2A repeats the analysis in Table 1 focusing on younger, less educated individuals (ages 16-to-24) and single mothers. We find a smaller share of workers but a somewhat larger share of minimum wage workers among younger, less educated individuals living in poor families (relative to all 16-to-64-year-olds) and a larger share of workers and a smaller share of minimum wage workers among poor single mothers (again, relative to all 16-to-64-year-olds). But the patterns by INR are the same. Appendix Table 2B repeats the analysis over the post-Great Recession period, which is examined below. While the share of workers and workers earning the minimum wage among working-age individuals living in poor families is smaller, the descriptive results show a qualitatively similar pattern of findings as shown in Table 1.

minimum wage[20], α_s is a time-invariant state effect, τ_t is a state-invariant year effect, and $\mathbf{X_{ist}}$ is a vector of controls identical to Dube (2019) including (i) individual demographic characteristics (indicators for race/ethnicity, gender, marital status, family size, number of children, educational attainment, and a cubic in age), (ii) state-level macroeconomic controls (unemployment rate and per capita income), and (iii) the state supplement to the EITC .[21] Our key coefficient of interest, β_1, is the impact of a one log-point change in the minimum wage on the probability an individual lives in a poor family. Therefore, $\beta_1 / \overline{Poverty}$ is the poverty elasticity with respect to the minimum wage. Dube (2019) refers to β_1 in equation (1) as the "contemporaneous" effect of the minimum wage on poverty. He also defines a "longer-run" estimate of the effect of minimum wage increases on poverty, defined as $\theta_1+\theta_2+\theta_3+\theta_4$ from equation (2) below:

$$Poverty_{ist} = \theta_0 + \theta_1 MinWage_{st} + \theta_2 MinWage_{st-1} + \theta_3 MinWage_{st-2} + \theta_4 MinWage_{st-3} + \mathbf{X_{ist}}\boldsymbol{\theta_5} + \alpha_s + \tau_t + \nu_{ist} \quad (2)$$

All regressions are weighted using the CPS population weight and standard errors are clustered at the state level (Bertrand et al. 2004).

In column (1) of Table 2, we *exactly replicate* Dube's "contemporaneous" (panel I) and "longer-run" (panel II) TWFE estimates of the effects of minimum wage increases on poverty (see Dube 2019; p. 299, Table 7, column 1). In the longer-run — defined by Dube (2019) as the sum of the poverty effects of the minimum wage contemporaneously, with a one-year lag, a two-year lag, and three-years following enactment — we replicate Dube's poverty elasticity of -0.220.

Disentangling the effects of minimum wage increases from the state business cycle is quite important given that minimum wage increases tend to be enacted pro-cyclically (Sabia 2014; Reich 2009). Dube (2019) controls for state-specific time-varying macroeconomic conditions by using two variables: per capita state Gross Domestic Product (GDP) and the state unemployment rate. While these measures are included with the intent of disentangling the effects of the minimum wage from state macroeconomic conditions, they could, in theory, capture employment or hours effects of the minimum wage, important mechanisms through which minimum wages may affect poverty. Controlling for these channels could, therefore, obscure the minimum wage's net poverty impact.

[20] Our measure of the minimum wage is nominal in nature to match Dube (2019), but we note that the use of the real value of the minimum wage (using a national CPI) produces identical estimated poverty elasticities with respect to the minimum wage given the inclusion of year fixed effects on the right-hand side of the regression equation.
[21] See https://www.openicpsr.org/openicpsr/project/116349/version/V1/view for do files and data to replicate estimates from Dube (2019).

In column (2) of Table 2, we make a single change to the specification in column (1). We replace per capita state GDP and the state unemployment rate with the state house price index, a more plausibly exogenous measure of macroeconomic conditions that captures changes in the average prices of single-family homes. This macroeconomic control has been used by other scholars in the minimum wage literature to capture state macroeconomic trends, while not directly controlling labor demand effects of the minimum wage (see, for example, Clemens and Wither 2019). This single change to equation (1), the results of which are shown in column (2), changes the sign of estimated poverty elasticity and renders it statistically indistinguishable from zero at convention levels. The 95 percent confidence interval around the longer-run treatment effect estimated in panel II of column (2) rules out poverty elasticities less than -0.066, which includes the point estimate of -0.220 shown in column (1) (and in column 1 of Table 7 in Dube 2019). At a minimum, the comparative findings in columns (1) and (2) suggest that Dube's evidence for poverty-reducing effects of the minimum wage increases over the period 1983-2012 is *very fragile* and depends heavily on the choice of state macroeconomic controls.

Column (3) adds the higher-skill average prime-age wage rate and the higher-skilled prime-age unemployment rate to the house price index. These controls are designed to further control for the state business cycle while only minimally capturing the primary mechanisms through which minimum wage increases could affect poverty among low-wage poor workers. In this specification, the estimated long-run poverty elasticity remains economically small — the absolute magnitude of the estimated minimum wage effect is nearly 75 percent smaller (in absolute magnitude) than in column (1) — and is nowhere near statistically distinguishable from zero.

In column (4), we generate our preferred specification, adding relevant social welfare policy controls not included by Dube (2019) (maximum TANF and SNAP benefits for family of four), as well as accounting for the refundability of the state EITC, which may have important differential labor supply effects.[22] The results in column (4) show a long-run poverty elasticity of 0.022, which is statistically indistinguishable from zero at conventional levels. The 95 percent confidence interval around this estimate rules out long-run poverty elasticities less than -0.139.[23]

[22] One other small way in which this model differs from Dube (2019) is in its definition of poverty for a small set of individuals. We follow the OPM and do not recalculate family income among families and subfamilies and reassign poverty thresholds to each.

[23] In Appendix Table 3, we include local (city and county) minimum wages (adjusted by the share of the population they cover) in our definition of the effective minimum wage, an extension beyond Dube (2019). This table includes our preferred set of macroeconomic and social welfare policy controls. Consistent with our findings using only state and federal minimum wage changes, we find little evidence of poverty-reducing effects of minimum wage increases.

3.2 Appropriateness of "Close Controls"

In Table 3, we explore the sensitivity of the estimated treatment to controls for spatial heterogeneity. We find that the inclusion of Great Recession-specific state effects (column 2) and state-specific linear time trends (column 3) do not change our finding of a null poverty effect (column 1) based on our preferred model in Table 2. Poverty elasticities are small and uniformly positive.[24]

Column (4) shows sensitivity of estimates to the inclusion of census division-by-year fixed effects. While designed to control for unmeasured region-specific shocks common to geographically proximate groups of states, this specification also restricts counterfactuals for states raising their minimum wages to geographically proximate states ("close controls"). The appropriateness of "close controls" remains a contentious issue in the minimum wage literature. For instance, in the case of the minimum wage's low-skilled employment effects, controls outside of a jurisdiction's census division often serve as more credible counterfactuals than controls inside the census division (Neumark et al. 2014). In addition, given that state minimum wage increases often occur in geographic clusters — and the concerns raised by Goodman-Bacon (2021) — it is not obvious that the states within the same census division are always the least contaminated controls.

When we force "close controls" through the inclusion of census division-specific year fixed effects in column (4), a significant and negative poverty effect of the minimum wage emerges relative to the prior columns. Here, we estimate a longer-run poverty elasticity of -0.363 (Table 3, panel II, column 4), which is not statistically different from the Dube-preferred estimate of -0.310.[25] The estimated longer-run treatment effect with the inclusion of state-specific linear time trends, Great Recession-specific state effects, and census division-specific year effects (Table 3, panel II, column 5) is very similar to that obtained when adding only census division-specific year fixed effects, suggesting that limiting counterfactuals to "close controls" within-census divisions is a key explanation for the poverty result reported by Dube (2019).

[24] We note that it is not always clear that this approach will generate a less biased estimated treatment effect than the TWFE estimator described in equation (1). For instance, in the presence of dynamic effects of the minimum wage on employment (Meer and West 2016), the inclusion of state-specific linear time trends may attenuate adverse labor demand effects and, consequently, *negatively* bias estimated poverty effects.

[25] In Appendix Table 4, we replicate our exercise, but using Dube' preferred macroeconomic controls. The inclusion of Dube's preferred macroeconomic controls and census division-specific year fixed effects generate even larger (in absolute magnitude) estimated poverty elasticities with respect to the minimum wage.

This finding suggests that in addition to the choice of macroeconomic controls, the appropriateness of "close controls" — forcing treatment and control states to be located within the same census division — is a central issue in assessing how the minimum wage affects poverty during the 1983-2012 period. How might we assess the appropriateness of forcing close controls? Here, we turn to a data-driven synthetic control approach to assess, on observables, the credibility of restricting counterfactuals to "close controls" (i.e., states within the same census division). This approach was similar to that used by Neumark et al. (2014) in assessing the appropriateness of comparing contiguous counties across state borders to assess the employment effects of the minimum wage (Dube et al. 2010).

For this analysis, we focus on prominent minimum wage increases ($1 per hour-year, $0.75 per hour-year, and $0.50 per hour-year).[26] To assess whether "close controls" serve as better counterfactuals on important observables, we generate a donor pool comprised of states inside and outside of the treatment state's census division to allow the synthetic approach to select among options that include close controls.[27] To ensure that the estimated treatment effect is not contaminated by control jurisdictions that also implemented prominent minimum wage increases — including those that enacted prominent increases just prior to the treatment state, which could result in biased treatment effects if poverty effects are dynamic (Goodman-Bacon 2021) — the donor pool is further limited to states that did not enact minimum wage increases during the period from three years before to one year after the treatment state enacted a prominent minimum wage hike.[28, 29]

In part to ensure that our choice of observable matching variables are not driving estimated treatment effects, we undertake four "matching strategies" to generate the synthetic control state for each treatment state: matching on (1) poverty rates in each of the three years prior to the enactment of a prominent minimum wage increase, (2) the pre-treatment mean of the poverty rate and a pre-

[26] The magnitude of minimum wage increases is calculated as the difference between the average effective state minimum wage over the full calendar year.
[27] This restriction allows us to examine 33 percent of all $1 per hour minimum wage increases, 39 percent of $0.75 per hour minimum wage increases, and 10 percent of $0.50 per hour minimum wage increases.
[28] A Goodman-Bacon decomposition of census division-specific TWFE estimates of the effect of a prominent minimum wage increase ($0.50 per hour) on poverty reveals that 48 to 79 percent of the weight in the estimated treatment effect comes from "later-adopting" versus "earlier adopting" states. In the presence of heterogeneous treatment effects across adoption time, this may be quite problematic for generating an unbiased estimate of the treatment effect.
[29] In addition, we explore the sensitivity of our findings to changing our donor pool by expanding this window to four years prior to two years after treatment and shrinking this window to 2 years prior to 1 year after treatment with a qualitatively similar pattern of results. For example, in Appendix Table 5, we modify our donor pool to include states with no prominent minimum wage increases for up to four years prior to the treatment state's enactment of a prominent minimum wage increase. The pattern of findings is the same as that reported in our main tables.

and post-treatment mean of the state house price index and the higher-skilled prime-age wage and unemployment rates (our preferred macroeconomic controls), (3) the pre-treatment mean of the poverty rate and a pre- and post-treatment mean of the state unemployment rate and state per-capita GDP (Dube's preferred macroeconomic controls), (4) the pre-treatment mean of the poverty rate and a pre- and post-treatment trend in the state house price index, the higher-skilled prime-age wage and unemployment rates, and EITC refundable credit rate and maximum TANF benefits.

The results of this exercise are shown in Table 4. We find that states that receive positive synthetic weights are disproportionately located outside of the treatment state's census division. Using the first matching strategy described above for prominent minimum wage increases of $0.75 or more (Table 4, Panel I, column 1), we find that a range of only 1.5 to 22.0 percent of the synthetic weight is assigned to states within the treatment state's own census division. The vast majority of the synthetic weight was estimated for states outside of the treatment state's census division across all regions.

If, instead of matching pre-treatment poverty trends, we rely more heavily on matching on trends in macroeconomic conditions (panel I, columns 2 and 3) and social welfare policies (panel I, column 4), a somewhat greater share of the synthetic weights is given to states within the census division, but none ever reach greater than 33 percent. Turning to prominent minimum wage increases of $1.00 or more (panel II) or increases of $0.50 or more (panel III), our results show a qualitatively similar pattern of results, with 0.0 to 33.3 percent of synthetic weights drawn from states within the treatment state's own census division. This pattern of findings shows that choosing a specification that includes controls for census division-specific year fixed effects restricts the control group to states that are less observably similar to treatment states than if control states from outside the census division had been allowed. This a priori restriction on the control group may lead to biased estimates of the treatment effect, which we explicitly test in Table 5.

In Table 5, we show difference-in-differences estimates from synthetic matched samples of treatments and synthetic controls. The first two panels (panels I and II) show the estimated treatment effects generated from the *restricted treatment sample* that requires each treatment state to have donor states within and outside of the treatment state's census division; the final two panels (panels III and IV) show estimates from the *expanded treatment sample*, which does not impose this restriction on treated states.[30] Across the alternate set of counterfactuals, we find no evidence that

[30] This loosening of the sample restriction allows us to examine 100 percent of all $1 per hour minimum wage increases, 85.7 percent of $0.75 per hour minimum wage increases, and 38 percent of $0.50 per hour minimum wage increases.

prominent minimum wage increases reduced poverty during Dube's sample period.[31] Together with descriptive evidence suggesting that minimum wage increases are very unlikely to deliver substantial income to the working poor, these findings suggest that evidence for large poverty-reducing effects of the minimum wage is weak.

3.3. Dynamic Difference-in-Differences Estimators

To descriptively test the credibility of the parallel trends assumption underlying our preferred TWFE estimator, we conduct event study analysis, which is novel to the minimum wage-poverty literature. First, we account for the continuous and cumulative nature of minimum wage increases; that the magnitudes of minimum wage increases vary over time and states may enact multiple minimum wage increases over time. While specifying minimum wage events in this manner removes the non-parametric appeal of a dichotomous event study specification (from an "all-absorbing" treatment state), it decomposes the minimum wage effect identified in equation (1) over time. Following Schmidheiny and Siegloch (2019) and Rees, Sabia, and Margolit (2021), we estimate:

$$Poverty_{ist} = \gamma_0 + \sum_{j \neq -1}^{3} \gamma_j D_{ist}^{j} + \boldsymbol{X}'_{ist}\alpha + \tau_t + \mu_s + \varepsilon_{ist}, \quad (3)$$

where *j* denotes event time and D_{cst}^{j} is a set of variables that captures the "intensity" of a minimum wage increase (i.e., the difference between the natural logs of the current and prior-year effective minimum wage levels) that occurred *j* periods from period *t*. Each γ_j is our estimated treatment effect over time relative to the reference time period $j(i,s,t) = -1$. Event-study analyses over the 1983-2012 period using the full distribution of minimum wage increases in Figure 2 shows no evidence of a violation of the common trends assumption (estimates of γ_j are generally equal to 0 for $j < -1$) nor any evidence that minimum wage increases reduce poverty among non-elderly individuals, either at the time of the minimum wage increase or in years following the minimum wage hike.

[31] State-by-state synthetic control estimates of the effect of prominent minimum wage increases on poverty provide little consistent evidence of significant poverty-reducing effects of the minimum wage (see Appendix Tables 6A-6C). For example, using the expanded treatment sample, of the 94 estimated treatment effects corresponding to a $0.75 minimum wage increase, 62 estimated effects are positive and 32 are negative, and the vast majority are not statistically distinguishable from zero at conventional levels.

One concern with the estimates presented thus far is that they could mask important heterogeneity in the effects of larger minimum wage increases (Clemens and Strain 2021). Moreover, in the presence of heterogeneous and dynamic treatment effects, TWFE estimates of the impact of minimum wage increases on poverty may be biased. In Figure 3A, we focus on these same prominent minimum wage increases and show event-study analyses using Callaway and Sant'Anna (2021) estimates for a $0.75, $1.00, and $0.50 per hour-year minimum wage increases. This approach uses "not-yet adopters" of prominent minimum wage increases as counterfactuals. We find no evidence of shorter- or longer-term poverty-reducing effects of prominent minimum wage increases.[32] This is true in specifications controlling for macroeconomic conditions using the house price index (panels a, b, and c) and controlling for smaller minimum wage increases (panels d, e, and f), consistent with the results obtained using the above synthetic control approaches.

In Figure 3B, we present event-study estimates based on the stacked difference-in-difference (DD) estimates in the spirit of Cengiz et al. (2019). We focus on an event window from three years prior to each prominent minimum wage increase and up to three years following the event (a seven-year event window). Our counterfactuals are restricted to the set of states that did not have any prominent minimum wage increases over the event window. One advantage of the stacked DD approach proposed by Cengiz et al. (2019) is that it does not require the first minimum wage increase to be an "all absorbing" state, but rather can account for multiple increases by the same treated state.[33] An inspection of the event-study analyses shown in panels (a) through (c) of Figure 3B shows estimates similar to those generated from the Callaway and Sant'Anna (2021) approach. Moreover, when we allow the prominent minimum wage to be an "all absorbing" state (where the treatment indicator turns on and remains on for the duration of the event window) and also allow the federal minimum wage changes to contribute to identification, panels (d) through (f) of Figure 3B produce a qualitatively similar pattern of results. Together, these results suggest that our main policy conclusion — the absence of substantial poverty-reducing effects of the minimum wage — is robust to the choice of new dynamic difference-in-differences estimator employed.

3.4. Heterogeneity Across Demographic Groups and Poverty Definition, 1983-2012

[32] Appendix Table 7 shows Callaway and Sant'Anna (2021) overall ATTs for these sized minimum wage increases with a consistent finding of a null effect.

[33] Following Cengiz et al. (2019), we focus on state changes in minimum wages to identify the treatment effect and include states bound by federal increases to be included in the control group, while also controlling for federal minimum wage increases and including a full set of event(cohort)-by-state and event-by-year fixed effects in the regression.

In Table 6, (panel I) we focus on our preferred specification (outlined in column 4 of Table 2) but now expand our analysis from non-elderly individuals to allow for heterogeneous policy impacts across demographic groups that may be more policy relevant and/or be more likely to be impacted by minimum wage increases in the spirit of Dube (2019): all individuals (including the elderly), working age adults, less educated individuals, younger less-educated individuals, single mothers, historically marginalized (i.e., Blacks and Latinos), and children under age 16. Across demographic groups, we find no evidence that minimum wage increases significantly reduce "contemporaneous" poverty. In fact, we find some evidence that minimum wage increases are associated with an increase in the probability that 16-to-24-year-olds without a high school diploma live in poverty, consistent with adverse employment effects (which we empirically explore when we discuss mechanisms in Section 6 below). Moreover, event-study analyses for each demographic group (shown in Appendix Figure 3) continue to show no evidence of shorter- or longer-run effects of the minimum wage on poverty.

In the "longer-run" (panel II) — estimated using equation (2) and defined as $\theta_1+\theta_2+\theta_3+\theta_4$ — we find some evidence of a redistribution of poverty between single mothers and younger, less-educated individuals. That is, we find that minimum wage increases are associated with a small (statistically insignificant) reduction in longer-term poverty among single mothers (estimated elasticity of -0.0864), but an increase in longer-term poverty among younger, less educated individuals (estimated poverty elasticity of 0.386.[34]

Taken together, the above regression results, in combination with descriptive evidence in Figure 1 and Table 1, cast important doubt on the hypothesis that minimum wage increases caused large reductions in poverty during the 1983-2012 period.

4. Minimum Wages in the Post-Great Recession Era

Next, we turn to the Post-Great Recession period, when there were frequent, large changes in state minimum wages. Table 7 shows TWFE estimates of the effect of post-Great Recession (2010-2019) minimum wage increases on poverty among non-elderly individuals (persons ages 0 to 64), mirroring Table 2. In column (1), we use the TWFE specification used by Dube (2019) — which includes macroeconomic controls for per capita income and the overall unemployment rate

[34] If we examine different income-to-needs cutoffs (i.e., whether an individual's family size-adjusted income falls below 50, 100, or 150 percent of the OPM threshold), we continue to find little evidence of poverty-reducing effects of the minimum wage for most demographic groups (see Appendix Table 8).

— and find no evidence that minimum wage increases affect the probability that a non-elderly individual lives in a poor family, either contemporaneously (panel I) or in the longer-run (panel II). The estimated longer-run poverty elasticity with respect to the minimum wage in thus specification is -0.038 in the Post-Great Recession Era, considerably smaller (in absolute magnitude) to the -0.220 he estimated during the earlier era (see column 1, Table 2). Importantly, during the 2010-2019 period, neither the choice of macroeconomic controls (columns 2 and 3) nor the addition of a wider set of social welfare policy controls column 4) changes this conclusion. In our preferred specification, we obtain a contemporaneous poverty elasticity of -0.006 (Panel I) and a longer-run poverty elasticity of 0.007 (Panel II). The precision with which this treatment effect is estimated would exclude, with 95 percent confidence, the longer-run poverty elasticity of -0.220 obtained by Dube (2019) in his TWFE specification.

In Tables 8A and 8B, we examine the contemporaneous (Table 8A) and longer-run (Table 8B) effects of the minimum wage on poverty, but extend the analysis in Table 7 in two ways: (1) we expand the set of income-to-needs cutoffs to define poverty to include those in deep poverty (INR < 0.50) as well as those near poverty (INR < 1.50), and (2) we allow the effects of minimum wage increases on poverty to be heterogeneous across demographic groups, including all aged individuals (including the elderly), the non-elderly, working-age individuals, non-elderly individuals with at most a high school diploma, 16-to-24 year-olds without a high school diploma, single mothers, Black and Hispanic non-elderly individuals, and children under age 16. We find no evidence that minimum wage increases affected contemporaneous (Table 8A) or "longer-run" (defined as the sum of the contemporaneous effect, the one-year lag, the two-year lag, and the three or more year lagged effects) poverty. When we examine a poverty threshold corresponding to INR < 1.50 for our outcome measure, the 95 percent confidence intervals around the minimum wage effects are such that we can rule out poverty elasticities of less than -0.148 or greater than 0.227.[35]

In Figure 4, we provide event-study estimates from equation (3). We find evidence in support of the parallel trends assumption in the pre-treatment period and little evidence that minimum wage increases reduced poverty, including up to three or more years following enactment.

One advantage of event-study analyses in the post-Great Recession era is that we have more choices in our set of counterfactuals when examining prominent minimum wage increases, including (1) not yet adopters of prominent minimum wage increases, or (2) never adopters of any minimum

[35] To calculate the lower bound elasticity, we calculate [(-1.96*.0221) + .0091]/0.231 = -0.148. To calculate the upper bound elasticity, we calculate [(1.96*.0221) + .0091]/0.231 = 0.227.

wage increase because there were no Federal minimum wage increases over the sample period. Event-study analyses using Callaway and Sant'Anna (2021) estimates on each of these sets of counterfactuals, shown in Figures 5A and 5B, provide no evidence that prominent minimum wage increases reduce poverty. [36,37] Moreover, stacked difference-in-differences estimates, including those that allow for multiple events occurring to the same treated unit (Figure 5C), provide little evidence of poverty-reducing effects of the minimum wage in the Post-Great Recession era.[38]

In Table 8C, we explore the sensitivity of this null poverty result to the use of the household rather than the family as the resource sharing unit to calculate poverty, thus allowing unrelated individuals residing in the same dwelling (i.e., cohabiting couples, same-sex partners when marriage rights were not extended to same-sex couples, roommates) to contribute income to shared resources. The results on longer-run poverty are, in the main, unchanged. In addition, we find that using the supplemental poverty measure (SPM) rather than the official poverty measure (OPM) to define poverty had no effect on our main finding (see Appendix Table 10 and Appendix Figure 4).[39]

In Appendix Table 11, we examine the sensitivity of our findings in Tables 8A-8C to use of (1) alternative dichotomous poverty measures based on higher income-to-needs thresholds of 2.0 and 3.0, and (2) a continuous income-to-needs ratio. We find no evidence that Post-Great Recession minimum wage increases affected these alternate measures of family (or household) resources.

Finally, in Table 9, we explore the robustness of estimated effects of post-Great Recession minimum wage increases on poverty to the addition of controls for spatial heterogeneity that are preferred by Dube (2019): state-specific linear time trends and census division-specific year effects

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[36] Figure 5A includes never adopters of any minimum wage increases as the counterfactuals.

[37] In Figure 5B, panels (a), (c), and (e) include controls for macroeconomic conditions and panels (b), (d), and (f) control for smaller state minimum wage increases (state minimum wage increases of $0.50 to $0.99 per hour if the prominent increase under study was $1.00 or higher or $0.75 or higher, and $0.25 to $0.49 if the prominent minimum wage under study examined was $0.50 or higher). In panel I of Appendix Table 9, we show Callaway-Sant'Anna estimates of the average effect of prominent minimum wage increases on treated states (ATT) if we restrict the counterfactuals to states that had enacted no minimum wage increases over the period. The pattern of findings is similar to the estimates we obtain when we include states with smaller minimum wage increases as counterfactuals and control for such increases (panel II).

[38] Counterfactuals include states that had no prominent minimum wage increase within the event window.

[39] The SPM includes the value of in-kind benefits such as SNAP and excludes necessary expenditures such as work-related transportation and taxes in calculating total family income. In addition, it uses a resource sharing unit that also includes some unrelated individuals who reside in the same household. Event study-analysis using Callaway and Sant'Anna (2021) estimates and focusing on the SPM, available in the March 2011-2020 CPS, supports the parallel trends assumption and produces no evidence of short- or long-run poverty effects (Appendix Figure 4). The findings in Appendix Table 10 provide no evidence that post-Great Recession minimum wage increases significantly reduce the probability of contemporaneous or long-run poverty.

(which force "close controls").[40] We find that estimated longer-run poverty elasticities are uniformly positive with the exception of the elasticity for Black or Hispanic individuals (Panel II, column 7), which is -0.124 and statistically indistinguishable from zero at conventional levels.[41]

The results discussed above provide robust evidence that the most recent minimum wage increases — those enacted by states in the post-Great Recession era (2010-2019) — had little impact on the probability that an individual lives in a poor family. The 95 percent confidence intervals around our policy estimates from our baseline TWFE model (Table 7) and our specification fully saturated with controls for spatial heterogeneity (Table 9) allow us to rule out the central long-run poverty estimates (INR < 1.0 for non-elderly individuals) reported by Dube (2019) in comparable specifications over the 1983-2012 period (-0.220 and -0.446, respectively). This policy estimate is potentially quite important for assessing the likely poverty effects of modern minimum wage increases.

5. Minimum Wages and Poverty Over Longer 1983-2019 Panel

Finally, we create a 37-year-panel from 1983-2019 — combining the analysis windows described in Sections 3 and 4 above — to estimate the effect of minimum wage increases on the probability of a person (with a given set of demographic characteristics) living in a poor family. Our findings in Tables 10A (contemporaneous) and 10B (longer-run) show little evidence that minimum wage increases reduce the probability of living in deep poverty (row 1), poverty (row 2), or near-poverty or poverty (row 3). The precision of our elasticities allows us to rule out, with 95 percent confidence, longer-run poverty elasticities with respect to the minimum wage of less than -0.131 for non-elderly individuals. This confidence interval would rule out most of the central estimates reported by Dube (2019) over the 1983-2012 period. Moreover, for all persons, we find that a 10 percent increase in the minimum wage is associated with a 0.17 percent increase in the probability

[40] In the longer panel examined by Dube (2019), he also interacts state dummies with the calendar years 2007, 2008, and 2009 to capture heterogeneity of the state business cycle across states but could also capture heterogeneous responses to the 2007-2009 Federal minimum wage increase across states (Clemens and Wither 2019). We return to this additional spatial heterogeneity control in our below analysis of a 37-year-long panel from 1983 through 2019.

[41] In Appendix Table 12, we show estimated poverty effects for each of our demographic subgroups for different multiples of the federal poverty threshold in specifications that include the full set of Dube-preferred controls for spatial heterogeneity. The findings continue to show no evidence of post-Great Recession minimum wage increases significantly affected the probability of living in deep poverty, near poverty, or below 200 percent or 300 percent of the federal poverty line.

that all persons live in a poor family.[42] The same is the case for Table 10C which again focuses on the longer-run but uses the household as the sharing unit.

Event-study analyses using the full distribution of minimum wage increases and TWFE estimates (Figure 6) and prominent minimum wage increases using Callaway and Sant'Anna (2021) (Figure 7A) and stacked difference-in-differences estimates (Figure 7B) show results consistent with the common trends assumption and continue to show no evidence of short- or longer-run poverty declines following the enactment of minimum wage increases.[43]

In Table 11, we explore the sensitivity of our estimated "longer-term" poverty elasticities over the 1983-2019 period to the use of Dube's preferred macroeconomic controls, as well as some additional spatial heterogeneity controls he employs. We focus on non-elderly individuals, his central sample. Panel I presents results using Dube's preferred TWFE specification while Panel II shows results from using our preferred specification. First, when we use the identical TWFE specification as Dube, simply extending his analysis period from 1983-2019 (column 1, Panel I), we find that relative to the poverty elasticity obtained in the 1983-2012 period (-0.220, as first reported in Table 2, the estimated poverty elasticity in the 1983-2019 period falls by over 50 percent in absolute magnitude to -0.102 and is rendered statistically indistinguishable from zero at conventional levels.

In subsequent columns of Table 11, we explore the sensitivity of these estimates to the inclusion of Great Recession year-by-state fixed effects (columns 2 and 5), state-specific linear time trends (columns 3 and 6) and the use of the household as the resource sharing unit (columns 4 through 6). Across all specifications, we find no evidence that minimum wage increases significantly reduce the probability of living in poverty.[44] With respect to using the household as the resource

[42] With 95 percent confidence, we can rule out poverty elasticities with respect to the minimum wage for all persons of less than -0.129.

[43] The average effect of the treatment on the treated using Callaway and Sant'Anna estimates (shown in Panel III of Appendix Table 7) — which restrict counterfactuals to not-yet-adopters of smaller minimum wage increases — provide little support for the hypothesis that minimum wage increases reduced poverty over the full 1983-2019 period. Moreover, alternate stacked difference-in-differences estimators that include federal changes in minimum wages as part of the treatment group (Appendix Figure 5) provide a similar pattern of results.

[44] As in the 1983-2012 period, we again find that forcing "close controls" in the 1983-2019 period through the inclusion of controls for census division-specific year fixed effects is likely problematic given that (1) a Goodman-Bacon decomposition of census division-specific estimates of the effect of, say, a $0.50 per hour or higher minimum wage increase on poverty reveals that 59 to 83 percent of the weight in the estimated treatment effect comes from "later-adopting" versus "earlier adopting" states, and (2) a synthetic control approach (across a variety of observable matching strategies and donor pools) shows that within-census division controls yield very small shares of the average weight in the construction of the synthetic counterfactual (see Appendix Table 13). Moreover, when we produce synthetic control estimates separately for each treatment event, we find that of the 125 (78) estimated treatment effects corresponding to a $0.75 ($1.00) minimum wage increase, 55 (34) estimates are positive and 70 (44) are negative. Matched synthetic control

sharing unit, the poverty elasticity reported in column (4) is estimated with sufficient precision such that we can, with 95 percent confidence, rule out elasticities less than -0.135 and greater than 0.174.[45]

6. Income Redistribution

Evidence in Figure 1 and Table 1 suggests limited scope for the minimum wage to reduce poverty among non-elderly and working age individuals given the small shares of minimum wage workers living in poor or near poor families. In Table 12, we show an additional reason why minimum wages may not be effective at reducing net poverty: their income effects. We provide estimates of the wage, employment, and hours effects of minimum wage increases over the 1983-2019 period on lower-skilled individuals: less educated individuals ages 16-to-24, single mothers ages 16-to-55, and Black or Hispanic working-age individuals ages 16-to-64.[46]

Our findings provide strong evidence that minimum wage increases increased the hourly earnings of low-skilled workers. We find that a 10 percent increase in the minimum wage is associated with a 0.5 to 1.0 percent increase in hourly wages (column 1) paid to less educated (those who have attained a high school diploma at most in row 1 or those without a high school diploma in row 2) 16-to-24-year-olds. In addition, for single mothers, we find that a 10 percent increase in the minimum wage is associated with a 1 percent increase in hourly wages (row 3, column 1).

However, for some low-skilled groups, we also find evidence of adverse labor demand effects (column 2). Specifically, we estimate significant negative employment elasticities of -0.144 and -0.273 for less educated younger individuals, (those with a high school degree or less and those with less than a high school degree,) precisely the demographic groups for whom adverse employment effects of the minimum wage are most often detected (Neumark and Shirley 2021; Fone et al. 2022). We also find evidence of minimum wage-induced declines in hours of work among employed working-age Black or Hispanic individuals (column 3), though we do not find much evidence of a significant wage effect for such individuals). For single mothers, however, we find little evidence of adverse employment effects, suggesting that this group may see income gains.

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difference-in-difference estimates, shown in Appendix Table 14, are consistent with a null impact of prominent minimum wage increases on poverty.

[45] Focusing on the 1983-2019 period, Appendix Table 15 uses a dependent variable set equal to 1 if the respondent lives in a family with income below 150 percent of the federal poverty line and 0 otherwise. The findings continue to show no evidence of poverty reducing effects of the minimum wage.

[46] However, we again note that just because these individuals are low-skilled does not necessarily mean that they live in poor families. For instance, in 2019, only 16.2 percent of less educated 16-24-year-olds and 23.4 percent of single mothers lived in poor families.

Together, these findings — along with poverty results discussed above — are consistent with income redistribution among low-skilled workers, some of which may also redistribute poverty. Those who experience hourly wage gains without employment losses or hours cuts see their net earnings rise, while those who see job loss or substantial hours reductions may see their net earnings fall.[47]

7. Target Efficiency of Federal Minimum Wage Proposals

We close with a discussion of whether newly proposed federal minimum wage increases are an efficient means of delivering income to workers who live in poor families (households). Specifically, we examine the likely target efficiency of newly proposed legislation that would raise the federal minimum wage to either $15 per hour (*Living Wage Now Act* or *Raise the Wage Act*) or $11 per hour, an alternative minimum wage proposal suggested by Senator Joe Manchin (D-WV) (Bolton 2021). We draw data from the March 2019 and March 2020 Current Population Survey and measure the hourly wages of workers in the current year (using the Outgoing Rotation Groups) against the income-to-needs ratios of their families (or households), measured in the year prior to the March survey.

Our findings in Table 13A show that a substantial share (63.7 percent[48]) of workers living in poor families earn wages greater than $11 per hour. They and their family members are more likely to be in poverty due to their low work hours or the size of their family. While some of these workers may indirectly benefit from "spillover effects" of the minimum wage on wages (perhaps through labor-labor substitution), some of these higher hourly wage earners will not be affected. If we examine the $15 minimum wage, a much smaller share of such workers earn hourly wages above this wage level (33.0 percent), which would suggest that they are much more likely to be affected by this larger minimum wage hike.

However, in the final two columns of Table 13A, we show that among those workers who would be directly affected by the two federal minimum wage proposals, those earning between $7.25 per hour and $11 (or $15) per hour, most low hourly wage workers do not live in poor families. We find that just 8.0 percent of those who would be affected by a $15 federal minimum wage and 11.9

[47] However, over both the full sample period (1983-2019, Appendix Table 2A) and the post-Great Recession era (2010-2019, Appendix Table 2B, we find that very few minimum wage workers live in poor families (or households).
[48] In row (1), 30.7 percent of workers in poor families earn $11 to $14.99 per hour, 19.6 percent earn $15 to $19.99 per hour, and 13.5% earn $20 or more per hour.

percent of those who would be affected by an $11 federal minimum wage live in poor families. Nearly two-thirds (64.4 to 68.9 percent) of affected individuals live in families with incomes of over two times the federal poverty threshold and about half (45.8 to 47.8 percent) live in families with incomes over three times the federal poverty threshold.

Turning to the household as the resource sharing unit (Table 13B), we find that proposed federal minimum wage increases are modestly less well targeted to poor households than poor families. Only 5.9 to 8.8 percent of those affected by $11 or $15 federal minimum wages live in poor households, while 69.5 to 74.1 percent live in households with income greater than twice the federal poverty threshold and 50.3 to 53.6 percent live in households with incomes over three times the federal poverty threshold. We conclude that even in the absence of adverse employment effects, raising the federal minimum wage is likely to be a very target inefficient means of delivering income to the working poor.[49]

8. Conclusions

For nearly a century, advocates of minimum wage increases have argued that raising the minimum wage will reduce poverty. A highly influential study by Dube (2019) suggests that these claims have merit. During the period from 1983-2012, he finds that minimum wage increases had substantial poverty- reducing effects, with poverty elasticities reaching as high as -0.9 (Dube 2019).

This study asks three questions: (1) How sensitive are the large poverty-reducing effects of minimum wage increases found by Dube (2019) to empirical specification choice, the definition of poverty, and the sample period under study? (2) Did minimum wage increases enacted during the decade following the Great Recession reduce poverty? (3) How well targeted are newly proposed federal minimum wage increases to the working poor? The answers to these questions are Very fragile, No, and Quite poorly.

While we are able to replicate Dube's results, we find his estimates of poverty-reducing effects of minimum wage increases enacted between 1983-2012 are (1) quite fragile with respect to macroeconomic controls that may, in theory, capture adverse low-skilled employment effects of the minimum wage, thereby negatively biasing estimated poverty effects, and (2) require "close controls" (control states within the same census division as treatment states) which are often less observably

[49] Appendix Table 16 shows results separately for the March 2019 and 2020 CPS surveys to ensure that reporting anomalies *during the collection of the March 2020* survey during COVID-19 pandemic did not systematically affect our results. Along the same lines Appendix Table 17 shows our main poverty regression results from columns (1) of Tables 10A and C using only the March 1984 through March 2019 CPS. The main findings of our paper are unchanged.

similar to treatment states In sharp contrast to Dube (2019), our preferred regression estimates show that minimum wage increases enacted over the 1983-2012 period has no effect on net poverty, including for demographic subgroups.

Moreover, using data from the post-Great Recession era (2010-2019), we find that recent, frequent, and large minimum wage increases had no effect on the probability that an individual lives in poverty. The estimated poverty effect is economically small, relatively precisely estimated, and nowhere near statistically distinguishable from zero across non-elderly individuals, all individuals, lower-skilled subgroups, and children. The result is robust to the choice of resource sharing unit (household versus family), model specification, event-study analyses, and newly developed difference-in-differences estimators that account for heterogeneous and dynamic treatment effects. Finally, turning to the 1983-2019 full panel, we continue to show relatively robust evidence of a null effect of minimum wages on poverty.

The poor performance of past minimum wage increases in curbing poverty can be explained by two important factors. First, most working-age individuals (ages 16-to-64) living in poor families are not employed and even fewer are steadily employed. Moreover, only 8 to 10 percent of working-age individuals living in poor or near poor families earn minimum wages such that they are likely to be affected. Second, minimum wage increases may cause adverse employment effects among some low-skilled workers, generating income redistribution rather than net income gains for the poor and near-poor. In addition, we note that our measures of poverty may understate the adverse effects of the minimum wage on family well-being to the extent that minimum wage hikes reduce fringe benefits and workplace amenities not captured by our resource measures (Clemens 2021).

Finally, we explore the target efficiency of a proposed future minimum wage increase, specifically focusing on the *Living Wage Now Act* and the *Raise the Wage Act,* the central provisions of which would raise the federal minimum wage paid to $15 per hour.[50] According to a February 2021 Congressional Budget Office (CBO) analysis, a $15 minimum wage would directly impact approximately 17 million U.S. workers earning hourly wages below $15, indirectly affect 10 million more who earn wages slightly above $15, and on net impact nearly half of the hourly paid workforce (Congressional Budget Office 2021; Bureau of Labor Statistics 2021). President Biden has argued that:

[50] The *Raise the Wage Act* would phase a $15 Federal minimum wage in over several years, reaching $15 for untipped workers by 2025. The legislation would also raise the "tipped" minimum wage from $2.13 to $15 per hour by June 2026 and eliminate subminimum wages for younger teenagers and workers with disabilities.

> "No matter where you work in America, if you work full time or 40 hours a week, you should not live in poverty. A $15 minimum wage accomplishes that." (Greenhouse 2021).

The high-profile study by Dube (2019) has been cited in Congressional testimony in support of a $15 minimum wage (Shierholz 2021; Reich 2019; Zipperer 2019). We find that even in the absence of adverse employment effects of minimum wage increases, a $15 (or $11) federal minimum wage would be a very target inefficient means of delivering income to the working poor. Specifically, we find that just 5.9 percent of the benefits of a $15 minimum wage will accrue to workers in poor households, while 62.7 percent of those affected live in households with incomes twice or more than the federal poverty line and 20.9 percent live in households with incomes three or more times the federal poverty line.

While it is important to exercise caution in predicting the poverty effects of a $15 federal minimum wage — which would, on average, increase the effective minimum wage faced by the average U.S. worker by over $5 per hour — our findings on prominent increases, in conjunction with new evidence on the employment effects of large minimum wage increases (Clemens and Strain 2021) suggest that the poverty-reducing effects of a $15 minimum wage is likely to be smaller than proponents hope, and certainly less target efficient.

In contrast to the minimum wage, expansions in eligibility criteria for and benefits from the Earned Income Tax Credit (EITC) may be more effective and more target efficient policy strategies to deliver income to the families (households) of the working poor than the minimum wage (Burkhauser and Corinth 2021; Burkhauser et al. 1996; Sabia 2008; Sabia 2014; Burkhauser 2014). Strong work incentives (on the extensive margin) (Burkhauser et al. 1996; Grogger and Karoly 2005; Neumark and Wascher 2011) and its eligibility criteria based on income make EITC expansions more likely to increase the resources of workers living in poor families and households.

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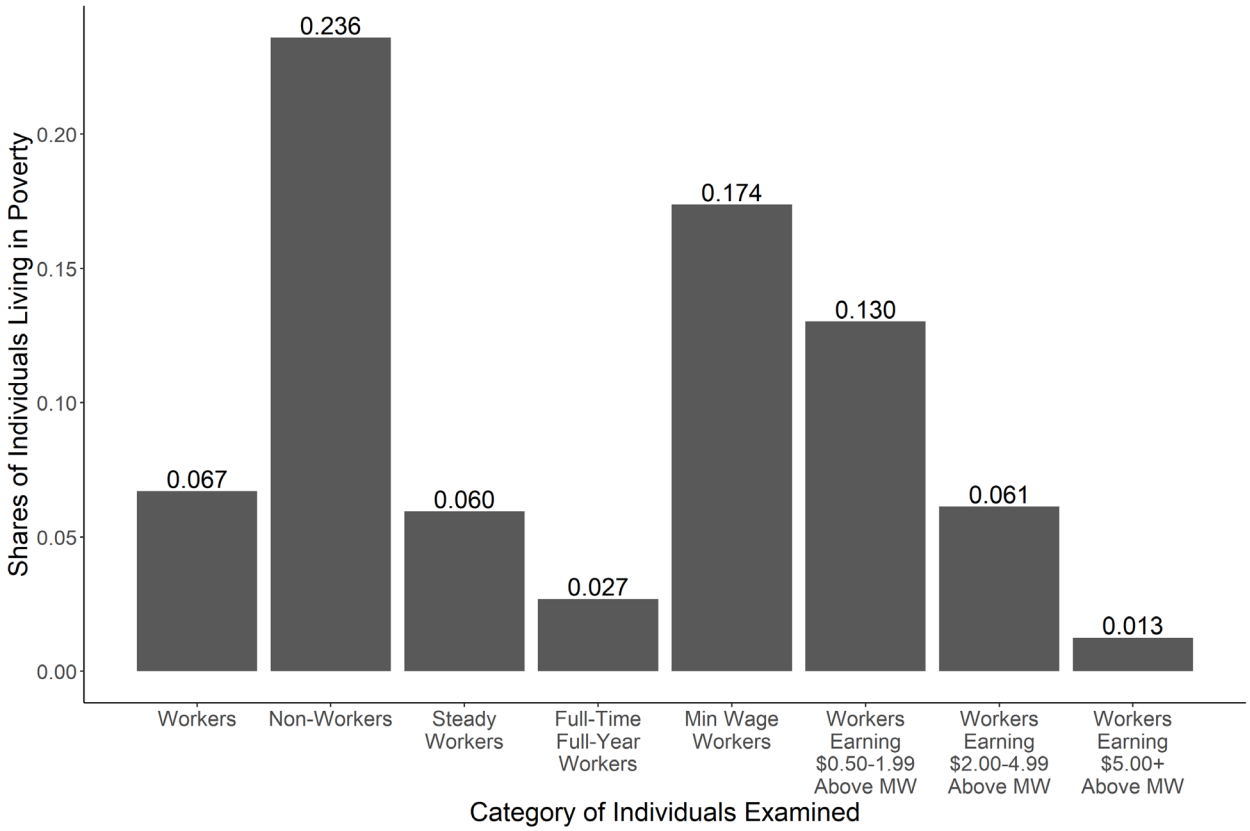
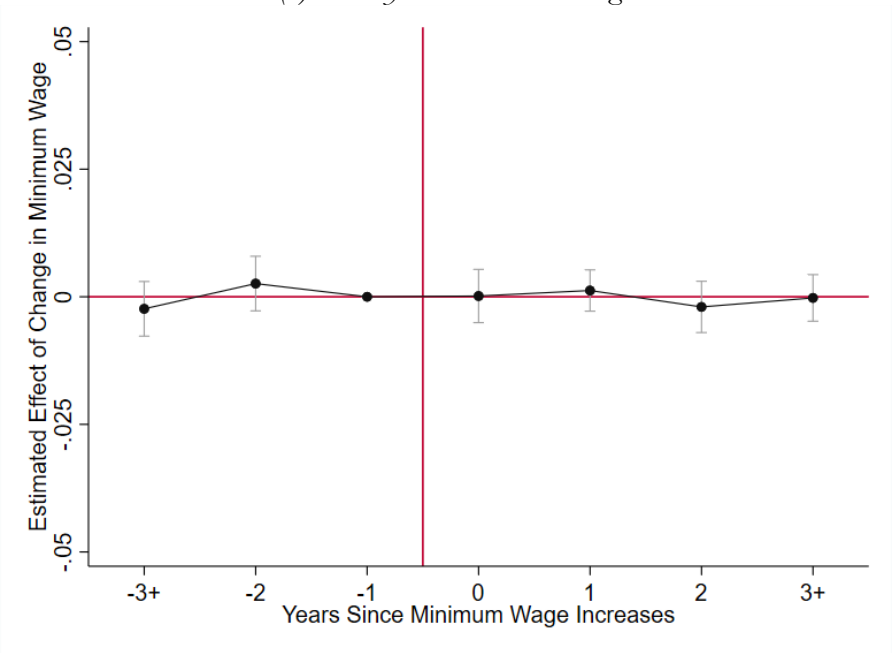
Figure 1. Share of Non-Elderly Individuals Living in Poverty, by Employment and Wages, 1983-2012



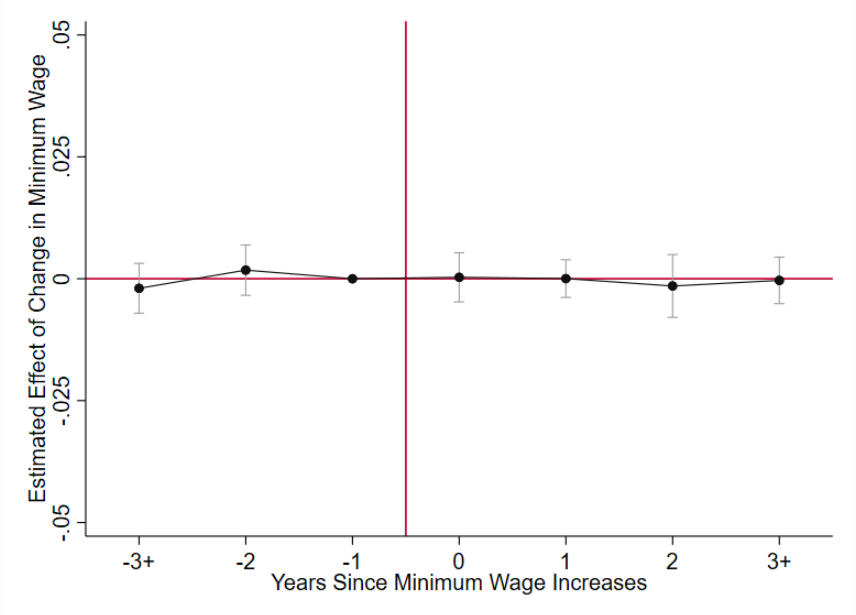
Notes: Data used to generate estimates are from the March 1984 through March 2013 CPS. Poverty is defined as an income-to-needs ratio less than 1.00 using the Official Poverty Measure (OPM). Workers are defined as non-elderly individuals who reported at least 1 week of employment. Non-workers are defined as those who reported zero week of employment. Steady workers are defined as those who worked at least 10 weeks and at least 10 hours a week. Full-year workers are defined as those who worked at least 50 weeks and at least 35 hours a week. Minimum wage (MW) workers are defined as workers whose wage was between 0.25 cents below the MW and 0.49 cents above the MW.

Figure 2. Event-Study Analyses of Minimum Wage Increases and Poverty, Dube Period 1983-2012

Panel (a): Family as Resource Sharing Unit



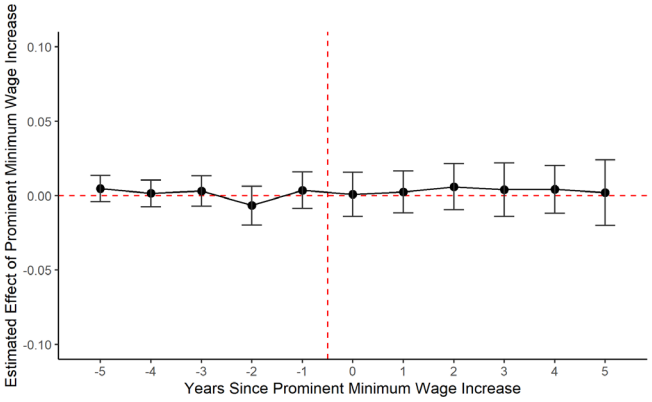
Panel (a): Household as Resource Sharing Unit



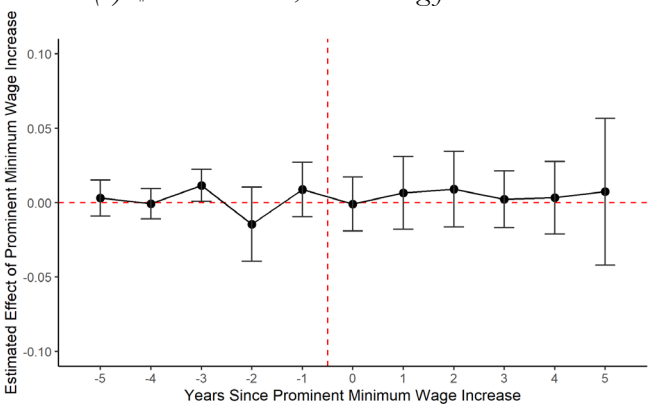
Notes: Data used to generate estimates are from the March 1984 through March 2013 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. All estimates include the full set of controls from our fully saturated model. The bar lines represent 95% confidence intervals generated using standard errors clustered at the state-level.

Figure 3A. Event-Study Analyses of Prominent Minimum Wage Increases, Using Callaway and Sant'Anna (2021) Estimates, Dube Period 1983-2012, Counterfactuals are Not-Yet Adopters of Prominent MWs

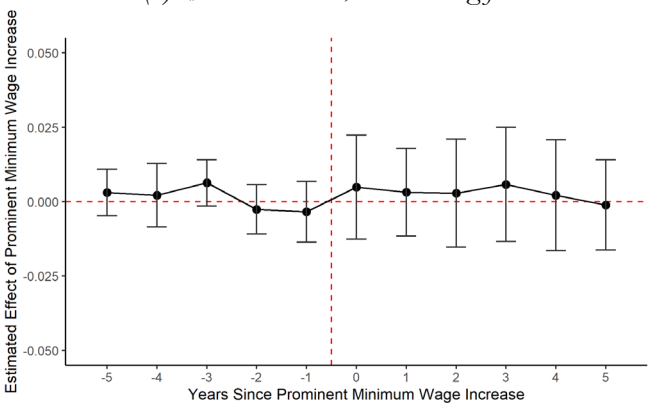
Panel (a): $0.75 Increase, Controlling for HPI



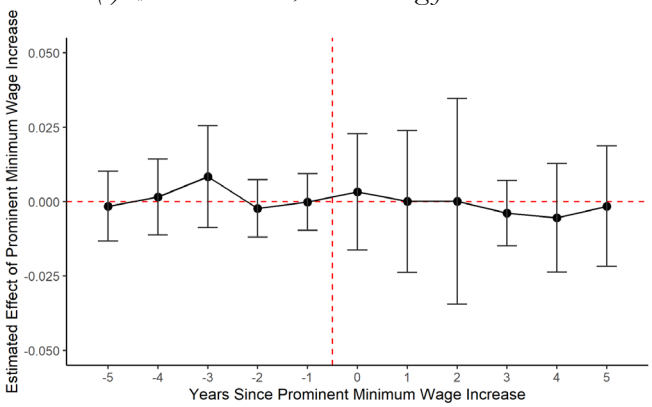
Panel (d): $0.75 Increase, Controlling for Smaller MWs



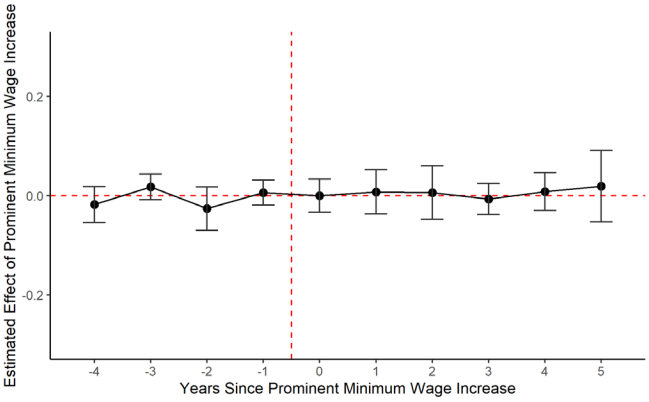
Panel (b): $1.00 Increase, Controlling for HPI



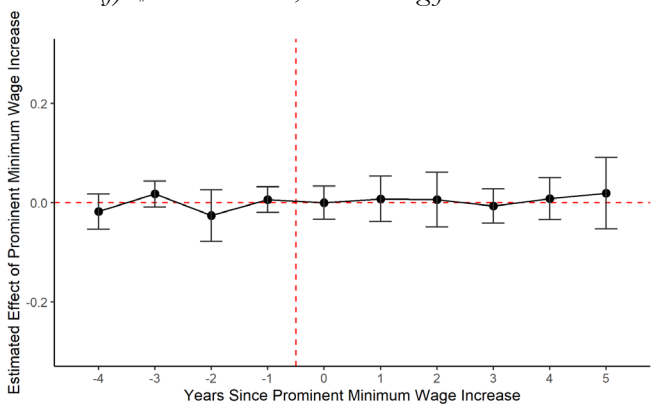
Panel (e): $1.00 Increase, Controlling for Smaller MWs



Panel (c): $0.50 Increase, Controlling for HPI



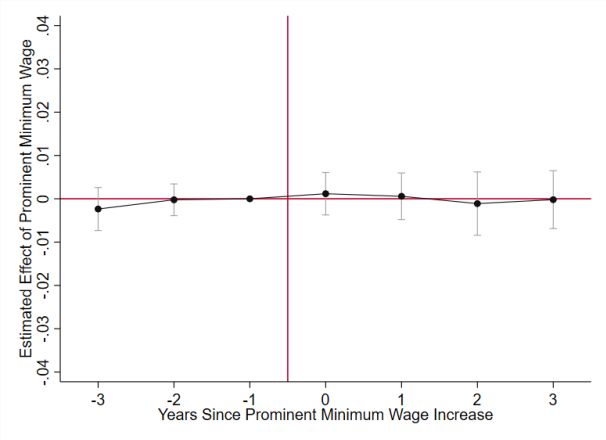
Panel (f): $0.50 Increase, Controlling for Smaller MWs



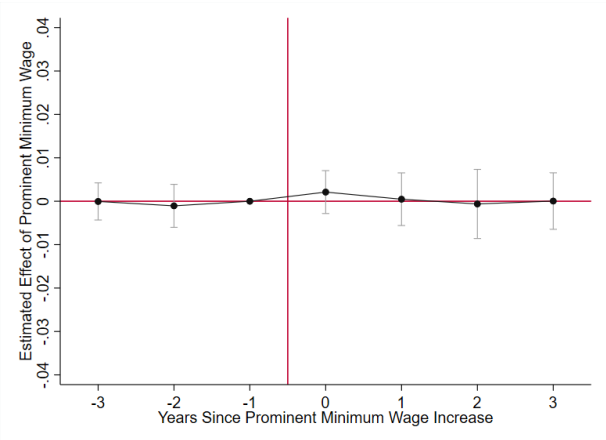
Note: Data used to generate estimates are from the March 1984 through March 2013 CPS. Estimates are generated using Callaway & Sant'Anna estimator, controlling for housing price index. Panels (a), (c), and (e) control for the state house price index. Panels (b) and (d) control for minimum wage increases between $0.50 and $0.74 and $0.50 and $0.99, respectively. Panel (f) controls for any minimum wage increase between $0.25 and $0.49 The vertical bars represent 95% confidence intervals generated using bootstrapped standard errors.

Figure 3B. Event-Study Analyses of Prominent State Minimum Wage Increases, Using Stacked Difference-in-Differences Estimates, 1983-2012, Counterfactuals are Not-Yet Adopters of Prominent MWs

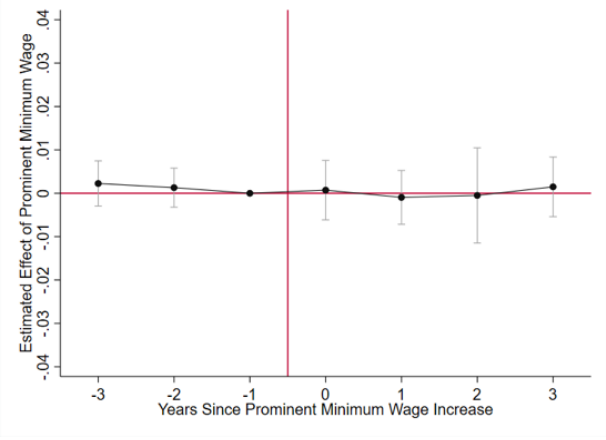
Panel (a): $0.75 Increase, Multiple Treatment



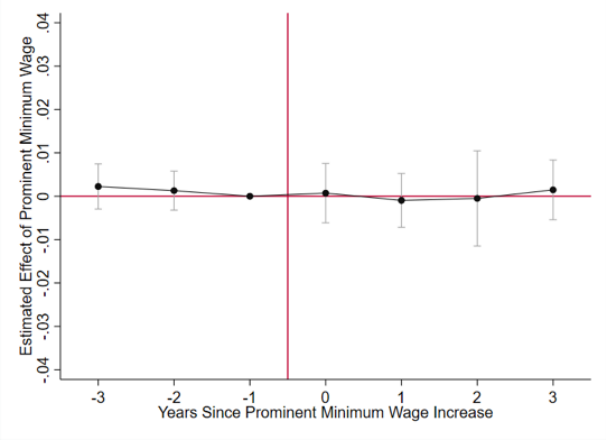
Panel (d): $0.75 Increase, All Absorbing



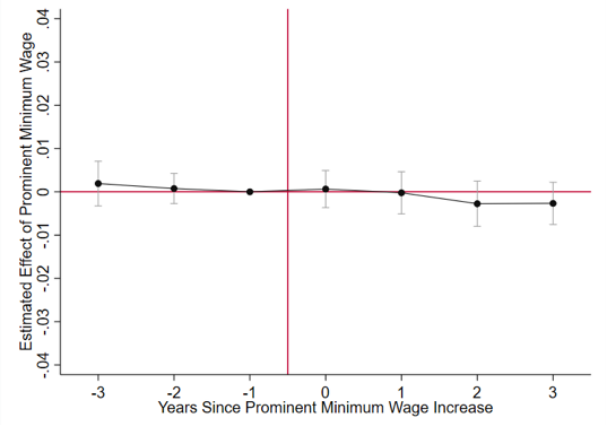
Panel (b): $1.00 Increase, Multiple Treatment



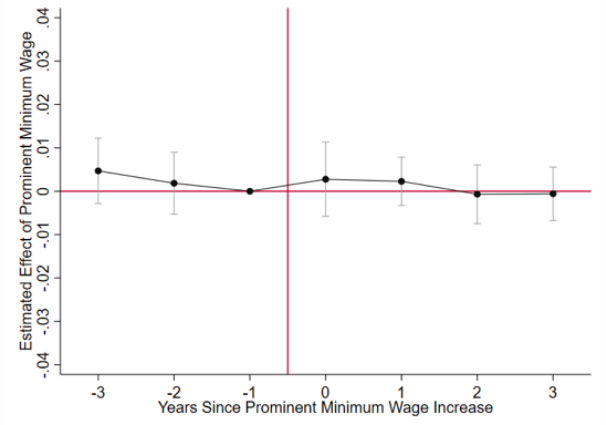
Panel (e): $1.00 Increase, All Absorbing



Panel (c): $0.50 Increase, Multiple Treatment



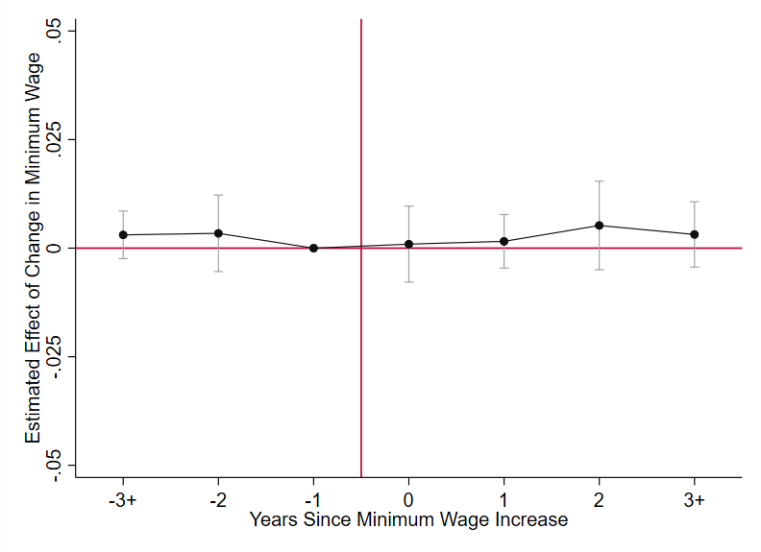
Panel (f): $0.50 Increase, All Absorbing



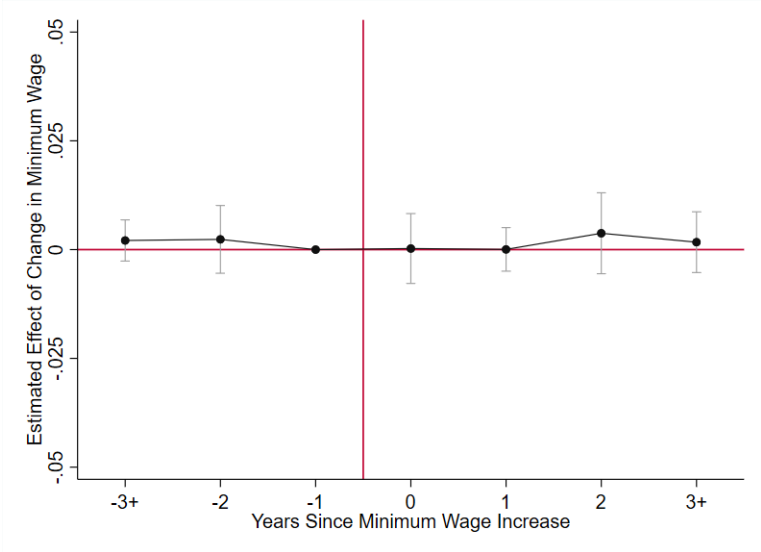
Notes: Estimates are generated using a stacked difference-in-difference approach following Cengiz et al. (2019). Control states are restricted to states that had not yet enacted a prominent MW increase during the event window nor had they enacted an increase of $0.50 or higher (including Federal increases). All regressions include state and year fixed effects and are weighted using the CPS person weight. All estimates include the full set of controls from our fully saturated model. In addition, panels (a), (b), (d), and (e) include controls for smaller minimum wage increases of 10 to 50 cents, and panels (c) and (e) include controls for smaller minimum wage increases of 10 to 25 cents. Panels (a) to (c) examine the effect of all state minimum wage increases, controlling for federal minimum wage changes. Panels (d) to (f) examine the effect of all absorbing state minimum wage increases, controlling for federal minimum wage changes. The bar lines represent 95% confidence intervals generated using standard errors clustered at the state level.

Figure 4. Event-Study Analyses of Minimum Wage Increases and Poverty, 2010-2019

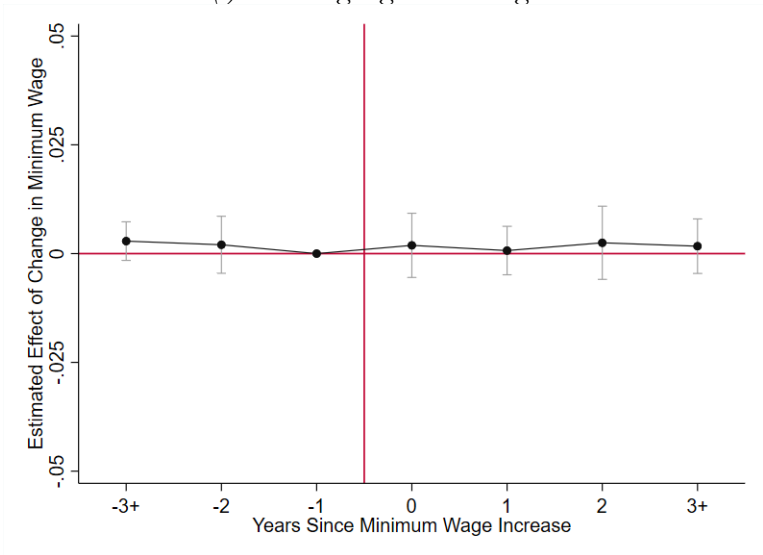
Panel (a): All Non-Elderly



Panel (b): All Individuals, Including Elderly



Panel (c): Working-Age Adults Ages 16-64



Panel (d): ≤ HS Degree, Working-Age Adults

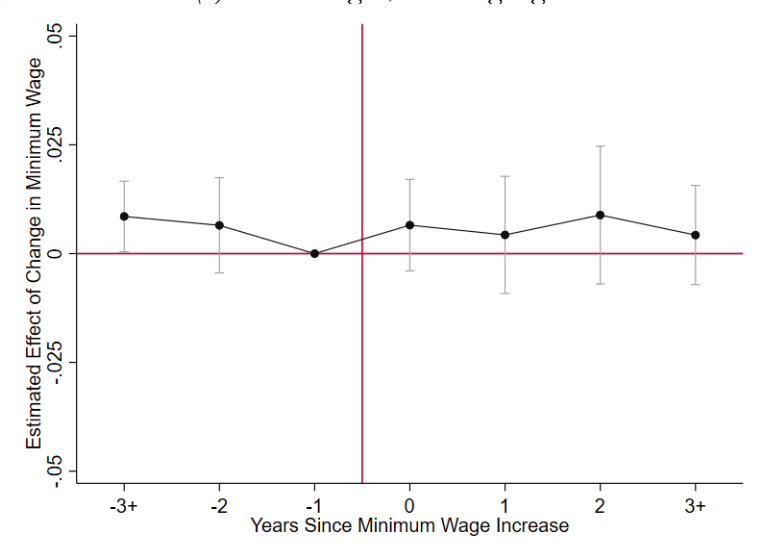
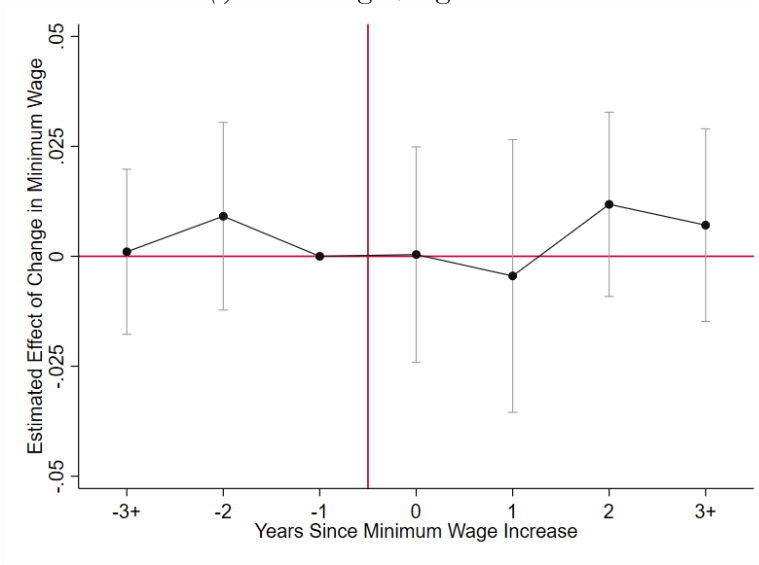
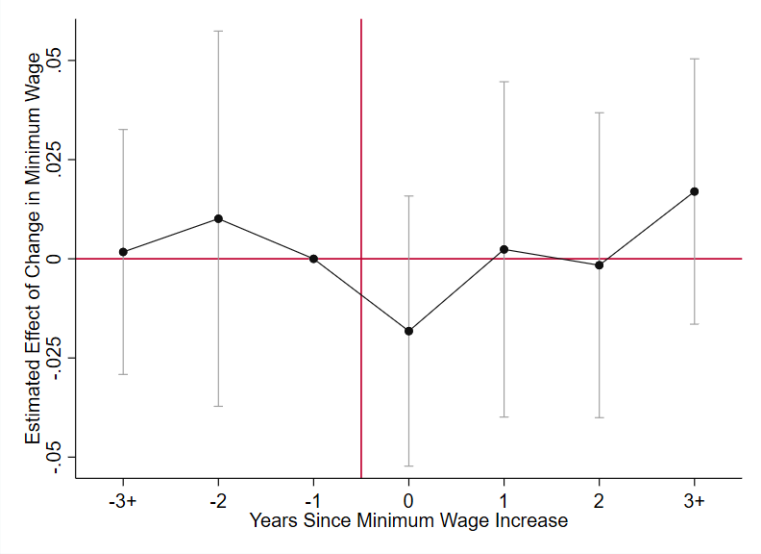


Figure 4, Continued

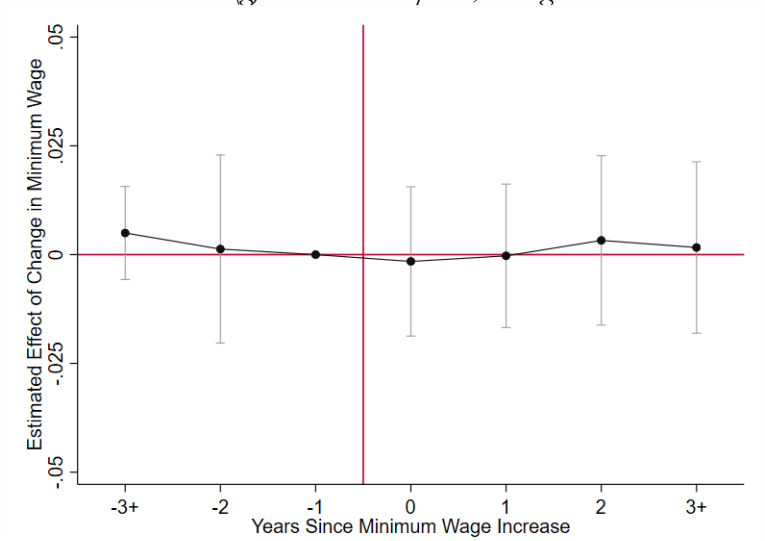
Panel (e): < HS Degree, Ages 16-24



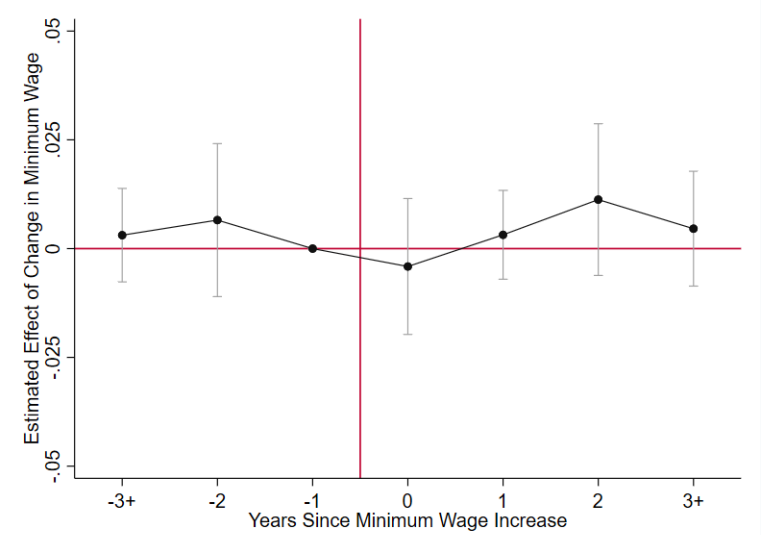
Panel (f): Single Mothers



Panel (g): Black or Hispanic, < Age 65

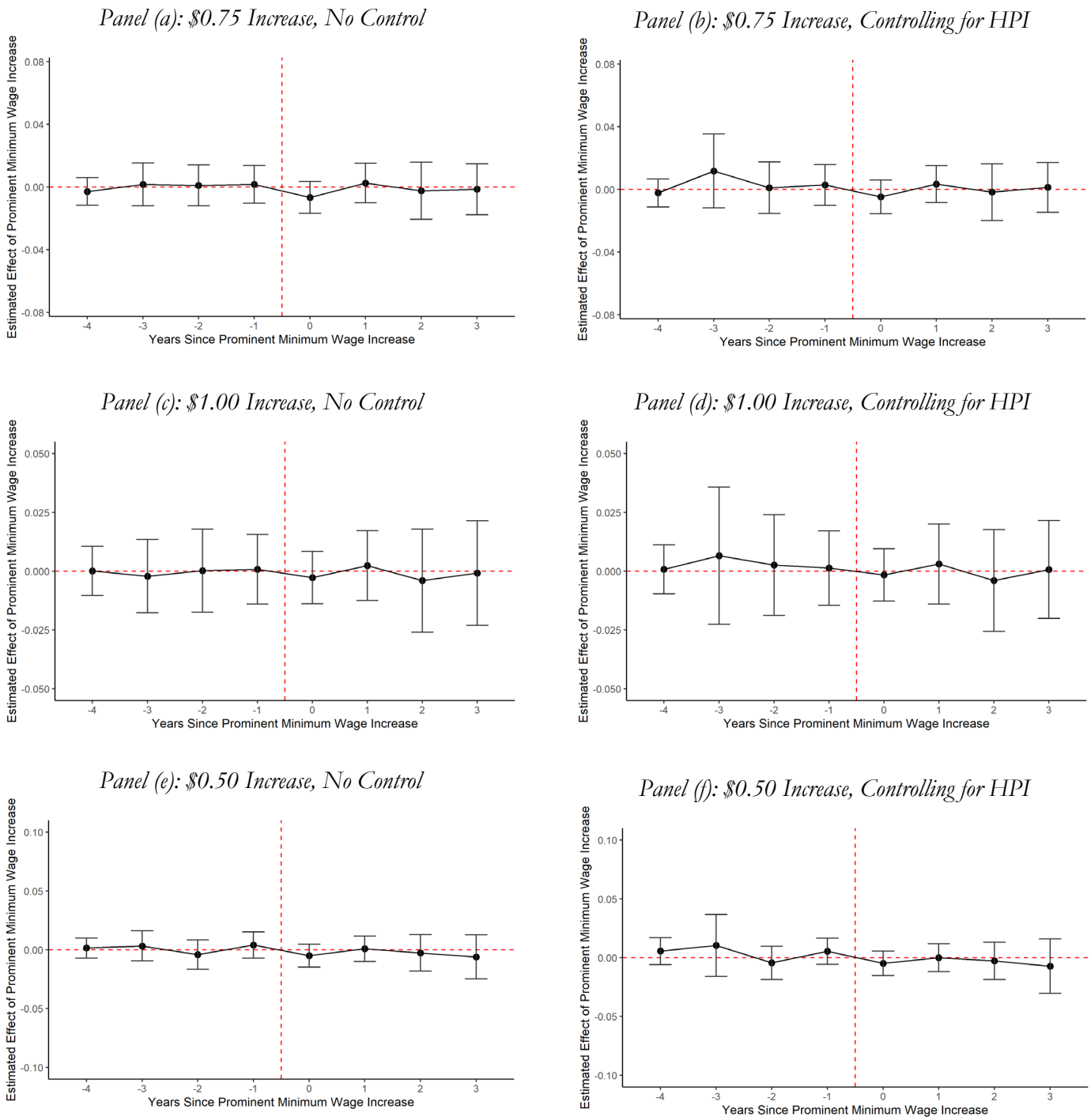


Panel (h): Children < Age 16



Notes: Data used to generate estimates are from the March 2011 through March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. The bar lines represent a 95% confidence intervals generated using standard errors clustered at the state-level.

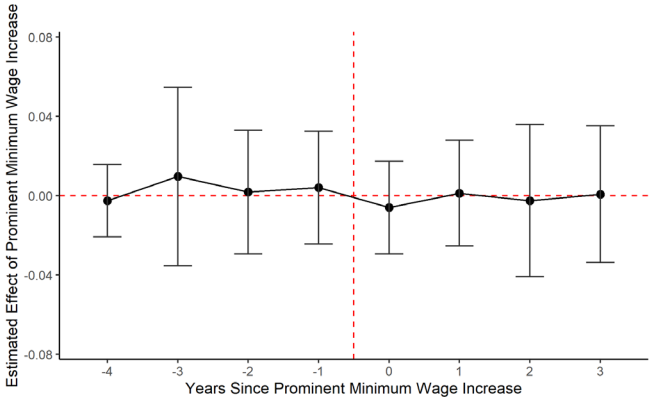
Figure 5A. Event-Study Analyses of Prominent Minimum Wage Increases, Using Callaway and Sant'Anna Estimates, 2010-2019, Counterfactuals: Never-Adopters of Any Minimum Wage Increases



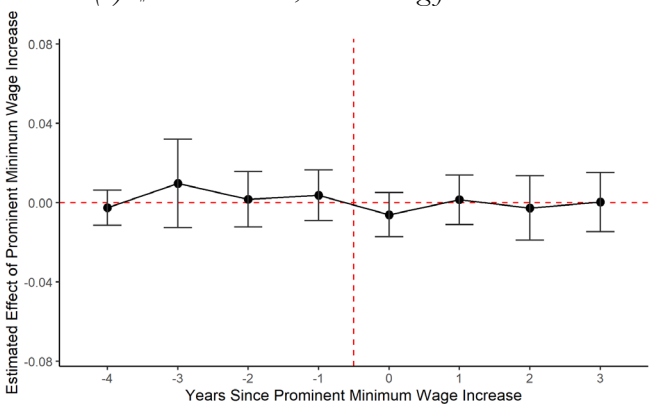
Note: Data used to generate estimates are from the March 2011 through March 2020 CPS. Estimates are generated using Callaway & Sant'Anna estimator. The control group is restricted to states without any minimum wage increases between 2010 and 2019. Panels (b), (d), and (f) control for the state house price index. The vertical bars represent 95% confidence intervals generated using bootstrapped standard errors.

Figure 5B. Event-Study Analyses of Prominent MW Increases, Using Callaway and Sant'Anna Estimates, 2010-2019, Controlling for Smaller MWs in Expanded Counterfactuals of Never-Adopters of Prominent MWs

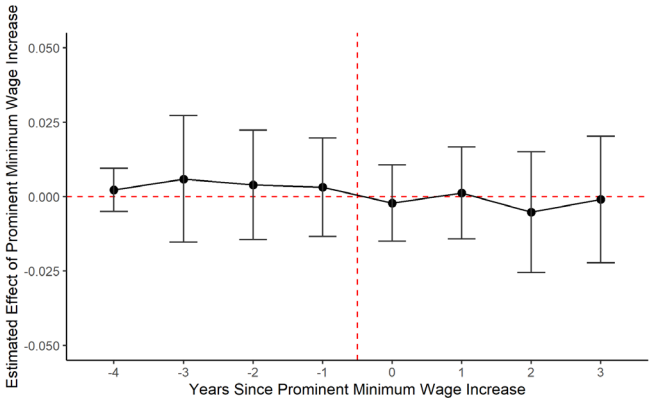
Panel (a): $0.75 Increase, Controlling for HPI



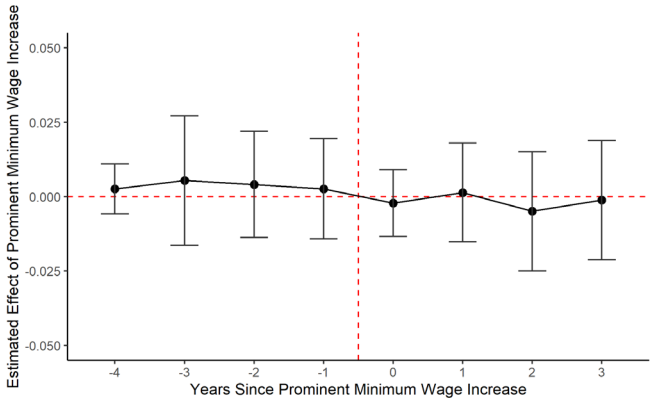
Panel (b): $0.75 Increase, Controlling for Smaller MWs



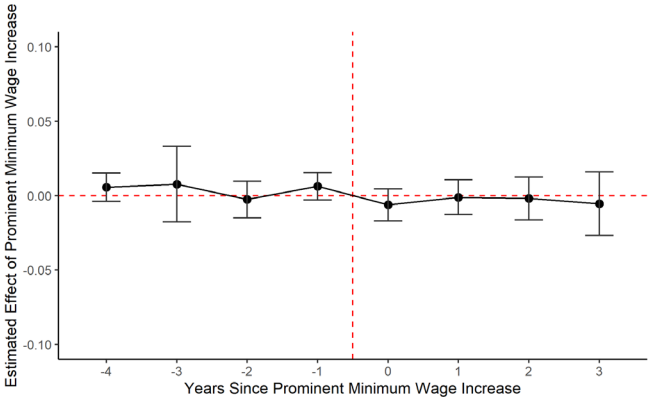
Panel (c): $1.00 Increase, Controlling for HPI



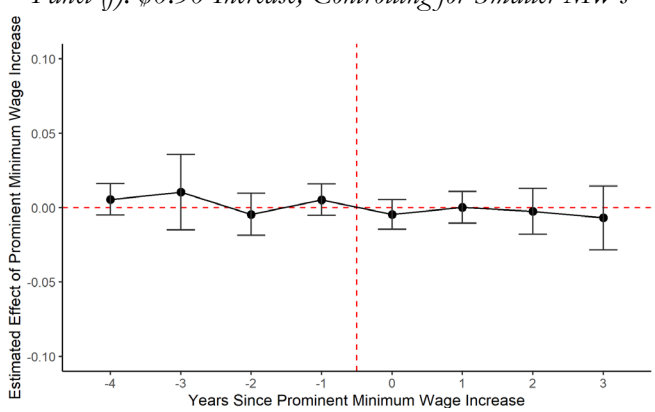
Panel (d): $1.00 Increase, Controlling for Smaller MWs



Panel (e): $0.50 Increase, Controlling for HPI



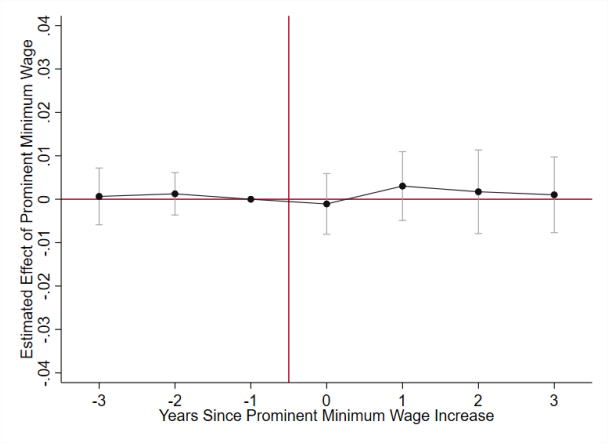
Panel (f): $0.50 Increase, Controlling for Smaller MWs



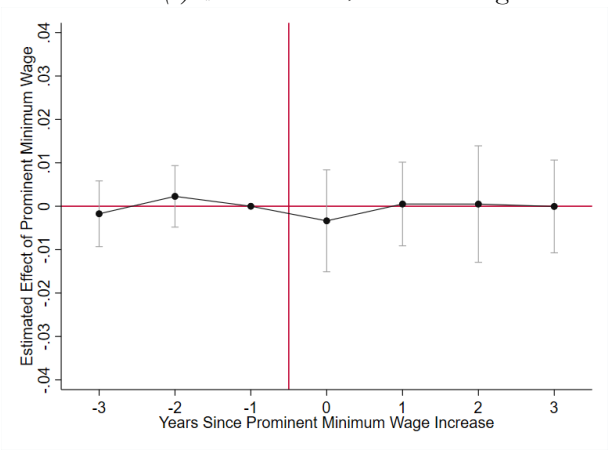
Note: Data used to generate estimates are from the March 2011 through March 2020 CPS. Estimates are generated using Callaway & Sant'Anna estimator, controlling for housing price index. Control groups includes states without prominent minimum wage increase. Panels (a), (c), and (e) control for the state house price index. Panels (b) and (d) control for minimum wage increases between $0.50 and $0.74 and $0.50 and $0.99, respectively. Panel (f) controls for any minimum wage increase between $0.25 and $0.49 The vertical bars represent 95% confidence intervals generated using bootstrapped standard errors.

Figure 5C. Event-Study Analyses of Prominent State Minimum Wage Increases, Using Stacked Difference-in-Differences Estimates, 2010-2019, Counterfactuals: Never-Adopters of Any Minimum Wage Increases

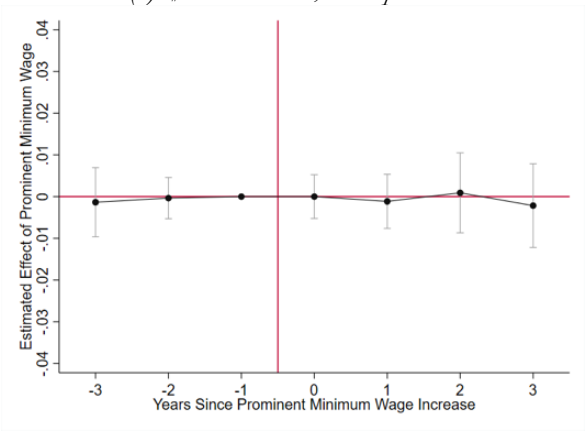
Panel (a): $0.75 Increase, Multiple Treatment



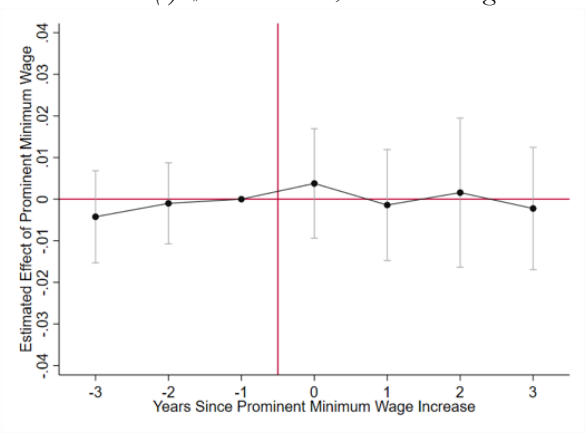
Panel (d): $0.75 Increase, All Absorbing



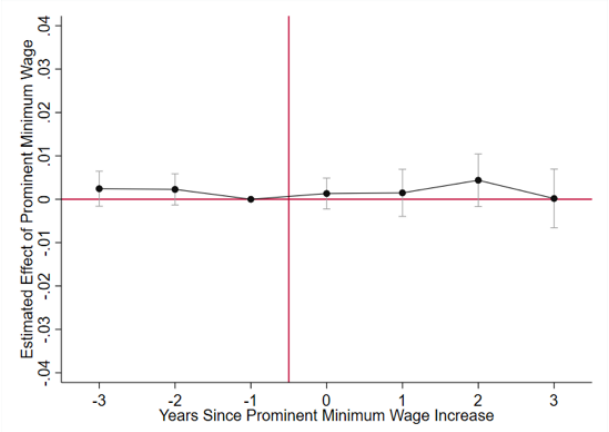
Panel (b): $1.00 Increase, Multiple Treatment



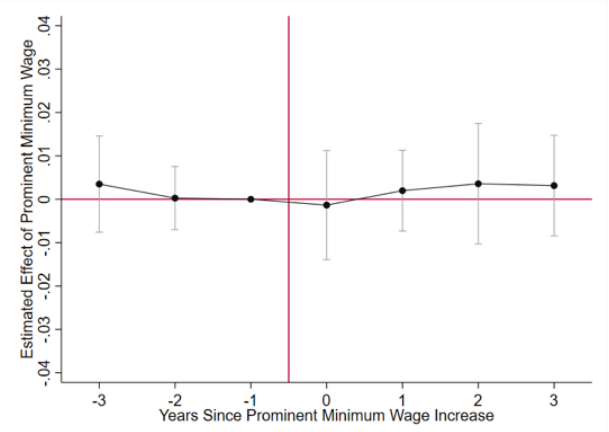
Panel (e): $1.00 Increase, All Absorbing



Panel (c): $0.50 Increase, Multiple Treatment



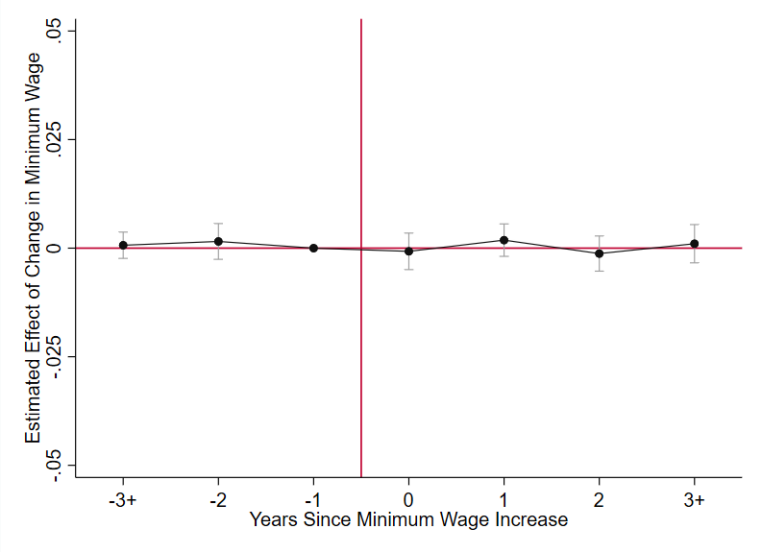
Panel (f): $0.50 Increase, All Absorbing



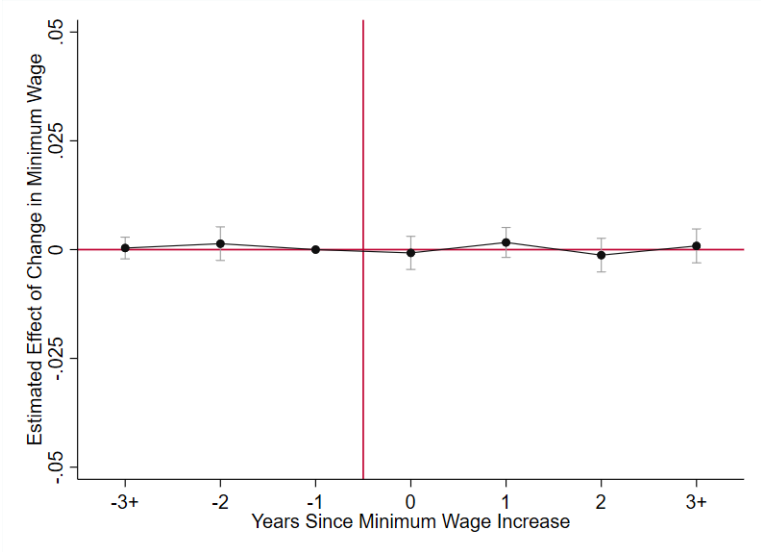
Notes: Estimates are generated using a stacked difference-in-difference approach following Cengiz et al. (2019). Control states are restricted to states that had not yet enacted a prominent MW increase during the event window nor had they enacted an increase of $0.50 or higher (including Federal increases). All regressions include state and year fixed effects and are weighted using the CPS person weight. All estimates include the full set of controls from our fully saturated model. In addition, panels (a), (b), (d) and (e) include controls for smaller minimum wage increases of 10 to 50 cents, and panels (c) and (e) include controls for smaller minimum wage increases of 10 to 25 cents. Panels (a) to (c) examine the effect of all state minimum wage increases. Panels (d) to (f) examine the effect of all absorbing state minimum wage increases, controlling for federal minimum wage increases. The bar lines represent 95% confidence intervals generated using standard errors clustered at the state-level.

Figure 6. Event-Study Analysis of Minimum Wage Increases and Poverty, Full Period 1983-2019

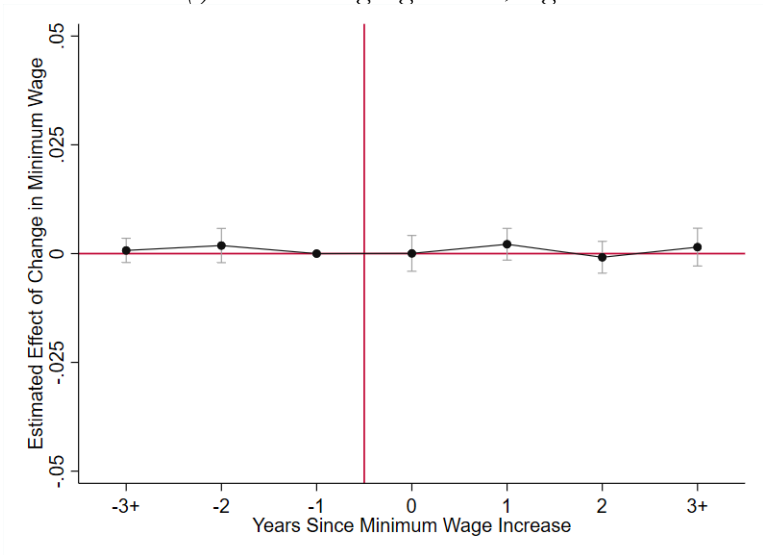
Panel (a): Non-Elderly < 65



Panel (b): All Individuals, Including Elderly



Panel (c): All Working-Age Adults, Ages 16-64



Panel (d): ≤ HS Degree, Ages <65

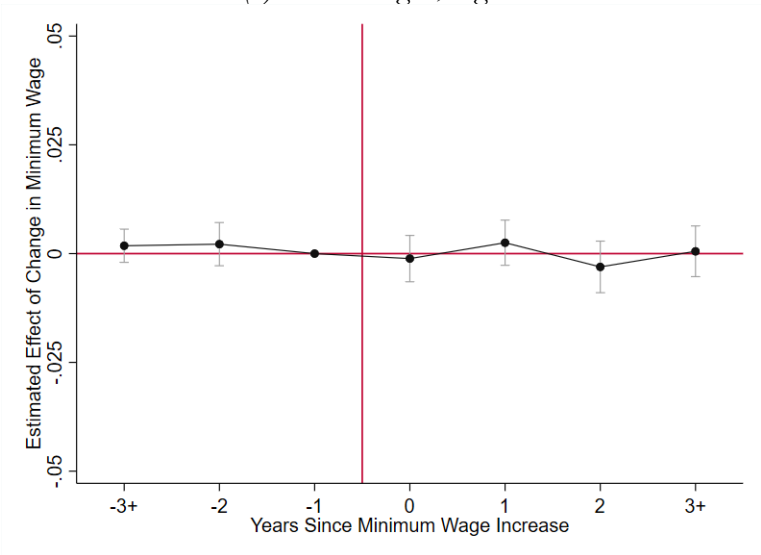
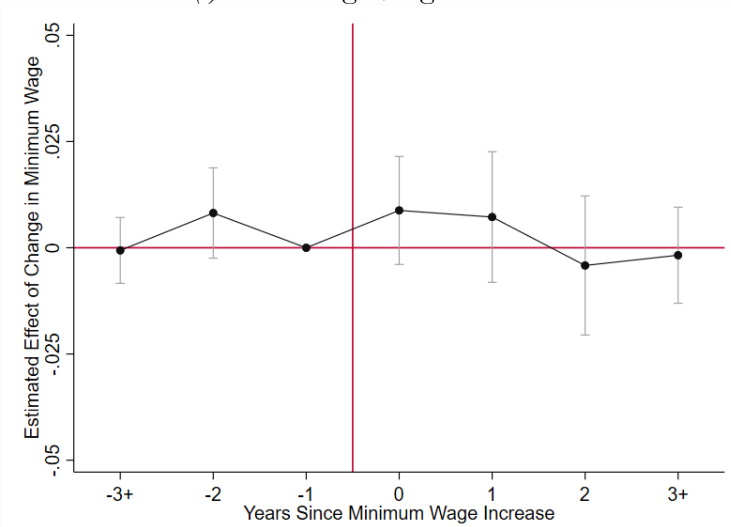
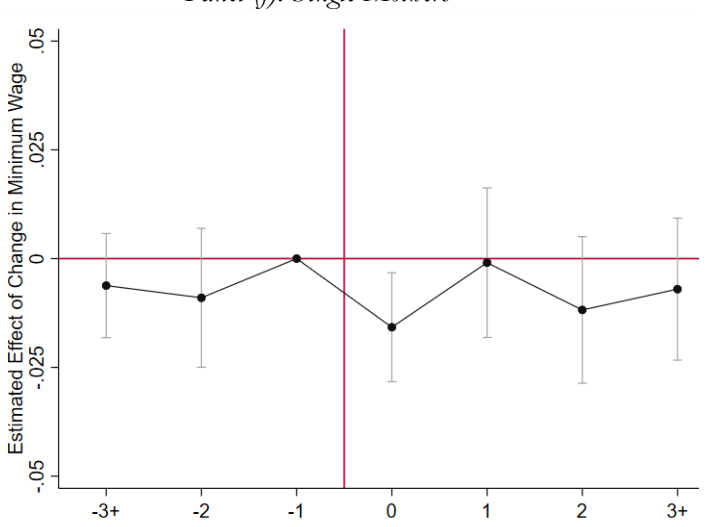


Figure 6, Continued

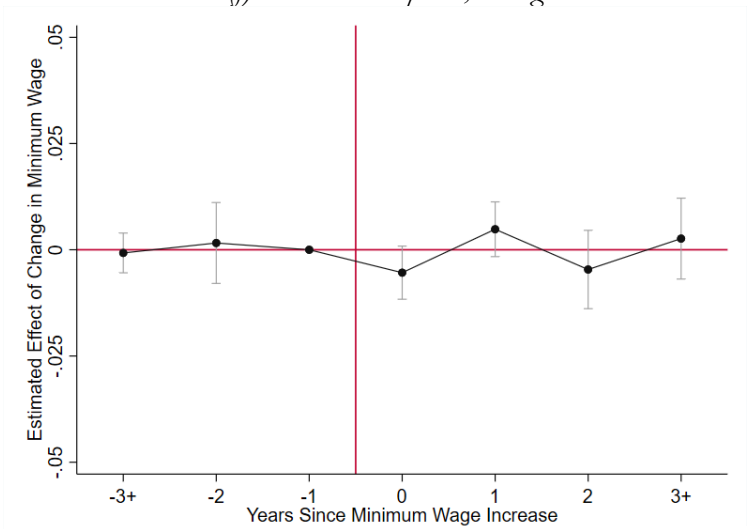
Panel (e): < HS Degree, Ages 16-24



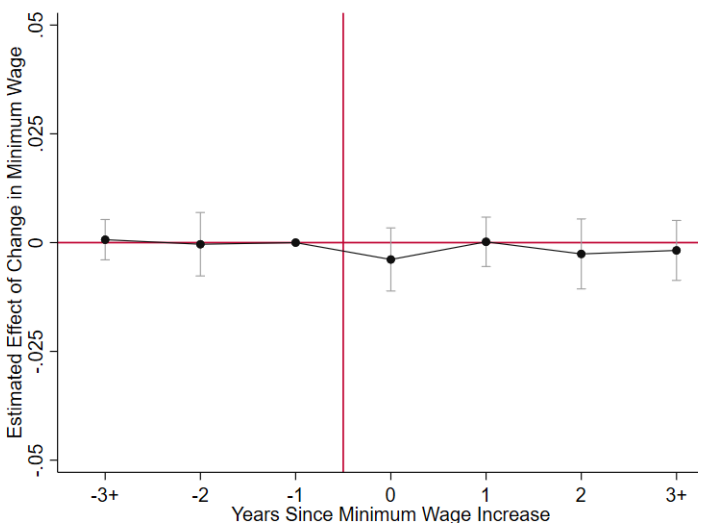
Panel (f): Single Mothers



Panel (f): Black or Hispanic, < Age 65



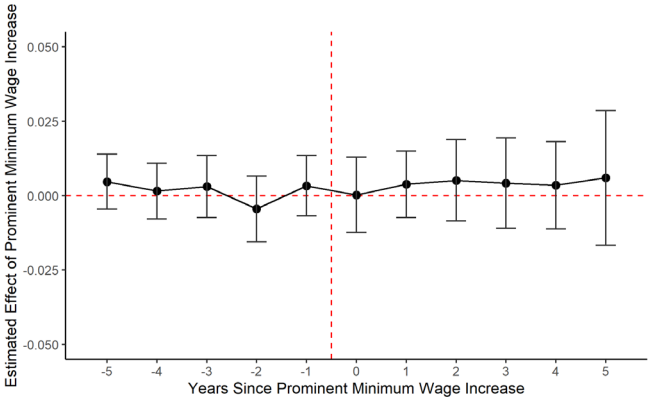
Panel (g): Children Under Age 16



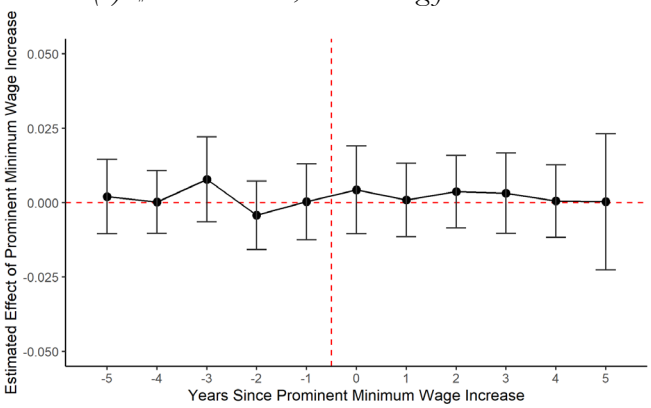
Notes: Data are drawn from the March 1984 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. All estimates include the full set of controls from our fully saturated model. In addition, panels (a) and (b) includes controls for smaller minimum wage increases of 10 to 50 cents, and panel (c) includes controls for smaller minimum wage increases of 10 to 25 cents. The bar lines represent a 95% confidence intervals generated using standard errors clustered at the state-level.

Figure 7A. Event-Study Analyses of Prominent Minimum Wage Increases, Using Callaway Estimates, 1983-2019, Counterfactuals are Never Adopters of Prominent MWs

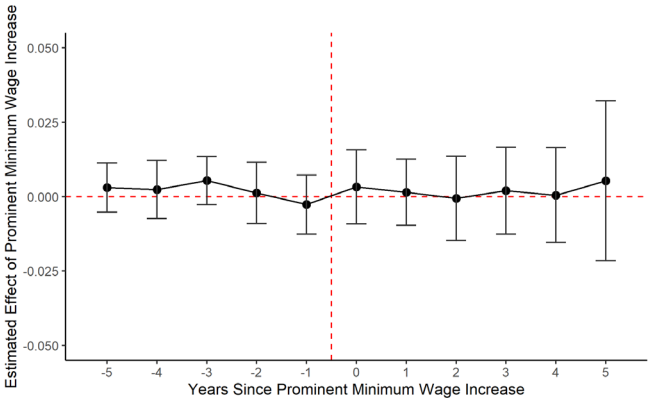
Panel (a): $0.75 Increase, Controlling for HPI



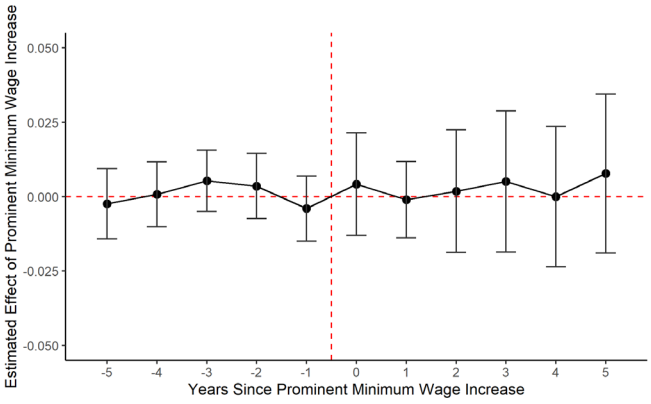
Panel (d): $0.75 Increase, Controlling for Smaller MWs



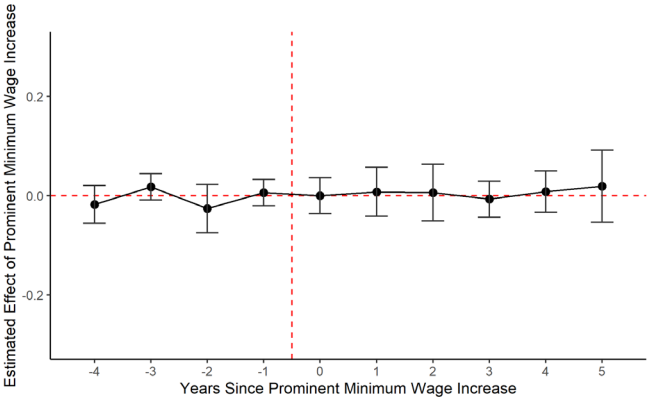
Panel (b): $1.00 Increase, Controlling for HPI



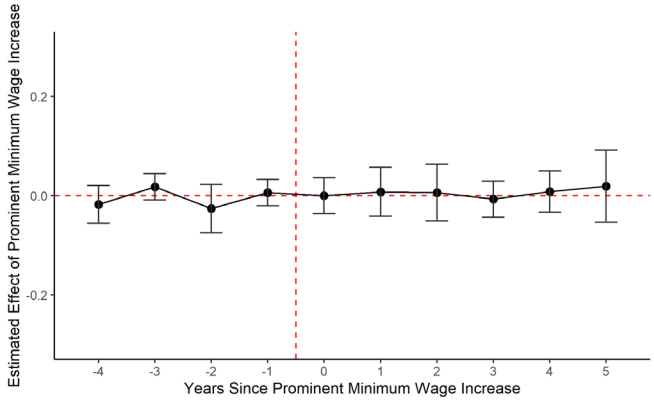
Panel (e): $1.00 Increase, Controlling for Smaller MWs



Panel (c): $0.50 Increase, Controlling for HPI



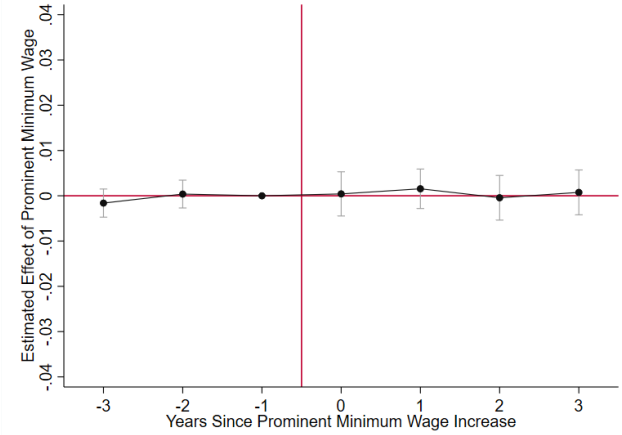
Panel (f): $0.50 Increase, Controlling for Smaller MWs



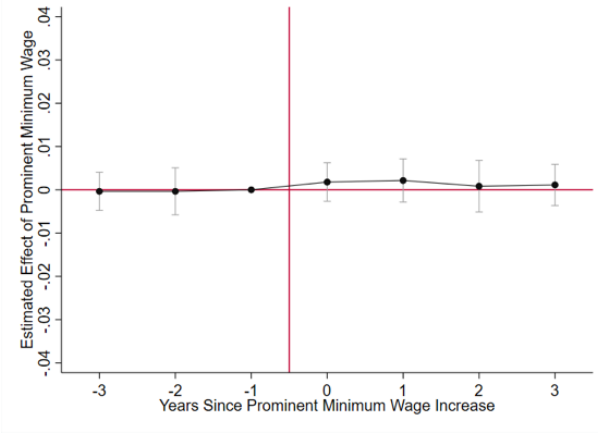
Note: Data used to generate estimates are from the March 1984 through March 2020 CPS. Estimates are generated using Callaway & Sant'Anna estimator, controlling for housing price index. Panels (a), (c), and (e) control for the state house price index. Panels (b) and (d) control for minimum wage increases between $0.50 and $0.74 and $0.50 and $0.99, respectively. Panel (f) controls for any minimum wage increase between $0.25 and $0.49 The vertical bars represent 95% confidence intervals generated using bootstrapped standard errors.

Figure 7B. Event-Study Analyses of Effect of Prominent State MW Increases, Using Stacked Difference-in-Differences Estimates, 1983-2019, Counterfactuals are Not-Yet Adopters of Prominent MWs

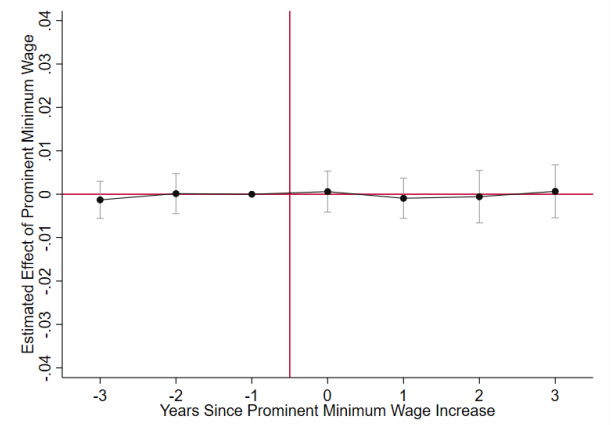
Panel (a): $0.75 Increase, Multiple Treatment



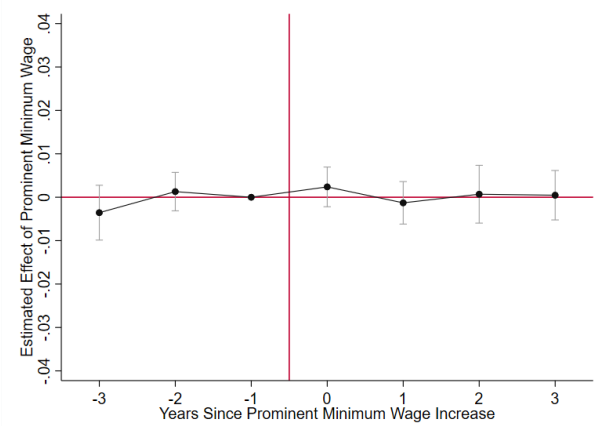
Panel (d): $0.75 Increase, All Absorbing



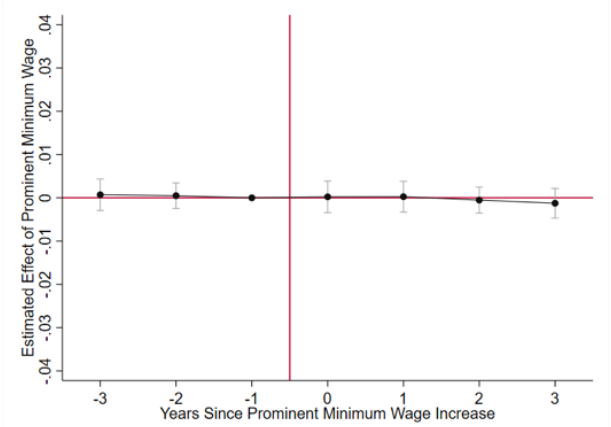
Panel (b): $1.00 Increase, Multiple Treatment



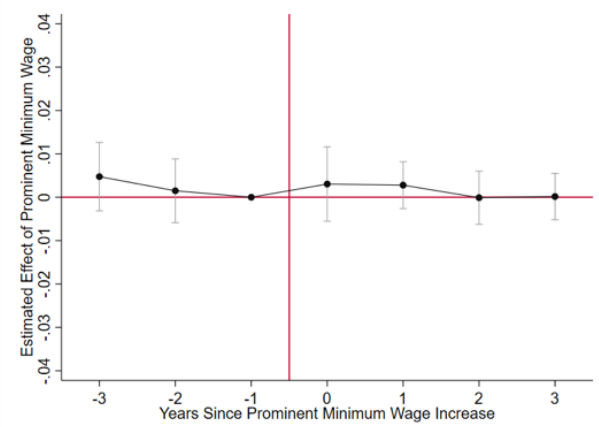
Panel (e): $1.00 Increase, All Absorbing



Panel (c): $0.50 Increase, Multiple Treatment



Panel (f): $0.50 Increase, All Absorbing



Notes: Estimates are generated using a stacked difference-in-difference approach following Cengiz et al. (2019). Control states are restricted to states that had not yet enacted a prominent MW increase during the event window nor had they enacted an increase of $0.50 or higher (including Federal increases). All regressions include state and year fixed effects and are weighted using the CPS person weight. All estimates include the full set of controls from our fully saturated model. In addition, panels (a), (b), (d), and (e) include controls for smaller minimum wage increases of 10 to 50 cents, and panels (c) and (e) include controls for smaller minimum wage increases of 10 to 25 cents. Panels (a) to (c) examine the effect of all state minimum wage increases, controlling for federal minimum wage changes. Panels (d) to (f) examine the effect of all absorbing state minimum wage increases, controlling for federal minimum wage changes. The bar lines represent 95% confidence intervals generated using standard errors clustered at the state level.

Table 1. Percent of Working-Age Individuals (Ages 16-to-64) Employed, Earning a Low Wage, or Earning at or Near Minimum Wage, by Income-to-Needs Ratios of Families or Households

	% Working	% Steady Employment	Annual Work Hours	% Employed and Earning Low Wage	% Employed and Earning Min Wage	Min Wage Annual Work Hours | Min Wage Workers
	(1)	(2)	(3)	(4)	(5)	(6)
Income-to-Needs Ratio						
				Panel I: Families		
Less than 0.50	34.9	26.4	330	24.7	9.1	930
0.50 to 0.99	52.6	46.9	684	33	10.2	1,395
1.00 to 1.49	65.4	60.9	1,030	28.3	8.6	1,544
1.50 or above	83.8	80.7	1,598	9.9	2.3	1,515
				Panel II: Households		
Less than 0.50	33.9	25.8	346	23.7	9.3	1,026
0.50 to 0.99	48.5	42.5	633	30	9.2	1,425
1.00 to 1.49	61.7	56.7	947	26	7.5	1,440
1.50 or above	83.2	80	1,569	10.6	2.6	1,503

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. All estimates are weighted. The sample is restricted to individuals ages 16 to 64. A worker is defined as an individual who works a positive number of hours in the last year. A steady worker is defined as an individual that worked at least 10 weeks last year and at least 10 hours a week. Columns (1) through (3) uses data from the full March CPS. Columns (4) through (6) uses data from the Outgoing Rotation Groups (so as to construct hourly wage rates). A low-wage worker is defined as an individual whose wages fall below 50% of the national average private wage for a given year. A minimum wage worker is defined as in individual whose wage is 25 cents below and 50 cents above the binding state minimum wage.

Table 2. Replicating Dube's TWFE Estimates from 1983-2012 and Exploring Sensitivity to Macroeconomic Controls

	1983-2012			
	Replication of Dube (2019)	*Sensitivity of Dube Results to Macroeconomic Controls*		*Our Preferred Model*
	(1)	(2)	(3)	(4)
	Panel I: Contemporaneous Effects			
Minimum Wage	-0.0101	0.0068	0.0003	0.0004
	(0.0084)	(0.0107)	(0.0100)	(0.0096)
Elasticity	[-0.074]	[0.050]	[0.002]	[0.003]
	Panel II: Long-Run Effects			
Minimum Wage	-0.0299**	0.0152	-0.0072	0.0030
	(0.0114)	(0.0123)	(0.0116)	(0.0112)
Elasticity	[-0.220]	[0.112]	[-0.053]	[0.022]
N	4,662,781	4,662,781	4,662,781	4,662,781
State Macroeconomic Controls and Model Choice:				
Unemployment Rate	Y	N	N	N
Per Capita GDP	Y	N	N	N
Housing Price Index	N	Y	Y	Y
College Grad Unemployment Rate	N	N	Y	Y
College Grad Average Hourly Wage	N	N	Y	Y
Model Choice	Dube	Dube	Dube	BMS

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates in columns (1) through (4) are from the March 1984 to March 2013 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age. The Dube model includes GDP per capita, EITC supplement, and unemployment rate. The Burkhauser, McNichols, and Sabia (BMS) model includes maximum Temporary Assistance for Needy Families (TANF), Earned Income Tax Credit (EITC) refundable rate, Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, housing price index, high skilled wage, and high skilled unemployment rate. It also does not disaggregate sub-families from primary families.

Table 3. Sensitivity of Estimated Poverty Effects to Inclusion of Great Recession-Specific Year Effects, State Linear Time Trends, and Census Division-Specific Year Fixed Effects ("Close Controls"), Dube Period 1983-2012

	(1)	(2)	(3)	(4)	(5)
			Panel I: Contemporaneous Effects		
Minimum Wage	0.0004	0.0026	0.0056	-0.0346***	-0.0298**
	(0.0096)	(0.0112)	(0.0107)	(0.0123)	(0.0138)
Elasticity	[0.003]	[0.020]	[0.043]	[-0.266]	[-0.229]
			Panel II: Long-Run Effects		
Minimum Wage	0.0030	0.0116	0.0031	-0.0472**	-0.0464**
	(0.0112)	(0.0105)	(0.0106)	(0.0212)	(0.0207)
Elasticity	[0.023]	[0.089]	[0.024]	[-0.363]	[-0.356]
N	4,662,781	4,662,781	4,662,781	4,662,781	4,662,781
Great Recession State Dummies	N	Y	N	N	Y
State-Specific Linear Time Trend	N	N	Y	N	Y
Census Division Specific Year Effect	N	N	N	Y	Y

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, a cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF), Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, housing price index, high skilled wage, and high skilled unemployment rate.

Table 4. Assessing "Close Controls" Using a Synthetic Control Approach, Dube Period 1983-2012

	Proportion of weight on states in the same census division					
	Match on Poverty Rate in Each Pre-Treat Year	Match on Mean Pre-Treat Poverty Rate & Preferred Macro Trends	Match on Mean Pre-Treat Poverty Rate & Dube's Macro Trends	Match on Mean Pre-Treat Poverty Rate, Preferred Macro Trends, & Policies	Average number of donor states	Average number of donor states in same division
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel I: $0.75 Minimum Wage Increase					
East North Central	0.018	0.157	0.000	0.056	39.000	3.000
Middle Atlantic	0.015	0.000	0.000	0.000	39.000	1.000
New England	0.167	0.297	0.325	0.215	6.667	3.333
Pacific	0.220	0.168	0.233	0.105	11.500	2.000
South Atlantic	0.016	0.056	0.003	0.154	39.600	6.600
	Panel II: $1.00 Minimum Wage Increase					
East North Central	0.018	0.157	0.000	0.056	39.000	3.000
New England	0.250	0.250	0.250	0.250	7.000	4.000
Pacific	0.009	0.000	0.134	0.000	42.000	1.000
South Atlantic	0.080	0.195	0.014	0.154	6.000	1.000
	Panel III: $0.50 Minimum Wage Increase					
East North Central	0.017	0.000	0.000	0.000	32.000	2.000
Middle Atlantic	0.006	0.333	0.068	0.333	12.000	1.000
New England	0.074	0.274	0.000	0.317	37.000	1.000
Pacific	0.320	0.323	0.295	0.000	12.500	1.250
South Atlantic	0.006	0.038	0.013	0.057	38.286	7.143

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. Weights are generated using synthetic control estimate. Donor pool is comprised of states without a minimum wage increase, 3 years before the treatment, during the treatment year, and 1 year after the treatment. Preferred macro trends include pre- and post- treatment trend of housing price index, unemployment rate, and wage among high education. Dube's macro trends include pre- and post-treatment trend of unemployment rate and per capita income. Social trends include pre- and post- treatment trend of EITC and TANF benefit.

Table 5. Synthetic Control Matched Difference-in-Differences Estimates of the Effect of Prominent Minimum Wage Increases on Poverty, Dube Period 1983-2012

	(1)	(2)	(3)	(4)
	$0.75 MW Increase	$1.00 MW Increase	$0.50 MW Increase	$0.25 MW Increase
	Panel I: Restricted Donor Pool: Must Include States Inside & Outside Census Division			
Minimum Wage	-0.0015	-0.0028	0.0033	0.0068
p-value	{0.988}	{0.625}	{0.828}	{0.69}
Δ in Prob of Poverty from MW	[-0.011]	[-0.021]	[0.025]	[0.051]
Maximum MW in Controls	$0.50	$0.50	$0.25	$0.10
	Panel II: Restricted Donor Pool: Must Include States Inside & Outside Census Division			
Minimum Wage	0.0008	-0.0205	0.0061	0.0068
p-value	{0.75}	{0.185}	{0.766}	{0.69}
Δ in Prob of Poverty from MW	[0.006]	[-0.154]	[0.046]	[0.051]
Maximum MW in Controls	$0.35	$0.35	$0.10	$0.05
	Panel III: Expanded Donor Pool: At Least One Donor State Available			
Minimum Wage	0.0048	0.0054	0.0016	0.0068
p-value	{0.214}	{0.395}	{0.887}	{0.81}
Δ in Prob of Poverty from MW	[0.036]	[0.041]	[0.012]	[0.051]
Maximum MW in Controls	$0.50	$0.50	$0.25	$0.10
	Panel IV: Expanded Donor Pool: At Least One Donor State Available			
Minimum Wage	0.003	-0.0011	0.0041	0.0068
p-value	{0.553}	{0.575}	{0.754}	{0.81}
Δ in Prob of Poverty from MW	[0.022]	[-0.009]	[0.031]	[0.051]
Maximum MW in Controls	$0.35	$0.35	$0.10	$0.05

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. All regressions include treatment state and year fixed effects. P-values generated from wild cluster bootstrapping are reported inside the curly brackets. Restricted treatment sample (panels I and II) includes only states where there are at least one donor states within the same census division and outside the census division. Expanded treatment sample (panels III and IV) includes all states where there is at least one donor state, inside or outside of the census division.

Table 6. Heterogeneity in Estimated Minimum Wage Effects, by Demographic Group, 1983-2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
	Panel I: Contemporaneous Effects							
Minimum Wage	0.0004	0.0045	0.0050	-0.0091	0.0987**	-0.0222	0.0029	-0.0160
	(0.0096)	(0.0096)	(0.0089)	(0.0136)	(0.0450)	(0.0174)	(0.0307)	(0.0152)
Elasticity	[0.0032]	[0.0350]	[0.0481]	[-0.0518]	[0.4808]	[-0.0965]	[0.0113]	[-0.0790]
	Panel II: Long-Run Effects							
Minimum Wage	0.0030	0.0045	0.0086	-0.0050	0.0791**	-0.0198	0.0179	-0.0217
	(0.0112)	(0.0106)	(0.0105)	(0.0160)	(0.0364)	(0.0225)	(0.0423)	(0.0192)
Elasticity	[0.0228]	[0.0356]	[0.0817]	[-0.0283]	[0.3855]	[-0.0864]	[0.0692]	[-0.1072]
N	4,662,781	5,238,862	3,332,535	3,019,445	262,481	965,820	1,211,366	1,330,242

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. The family is the resource sharing unit. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF), Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, housing price index, high skilled wage, and high skilled unemployment rate

Table 7. TWFE Estimates of the Effect of Minimum Wage Increases on Poverty in Post-Great Recession Era, 2010-2019

	2010-2019			
	Dube (2019) TWFE Model	*Sensitivity of Results in Column (1) to Macroeconomic Controls*		*Preferred TWFE Model*
	(1)	(2)	(3)	(4)
	Panel I: Contemporaneous Effects			
Minimum Wage	-0.0003	0.0056	0.0052	-0.0009
	(0.0214)	(0.0155)	(0.0157)	(0.0166)
Elasticity	[-0.003]	[0.041]	[0.038]	[-0.006]
	Panel II: Long-Run Effects			
Minimum Wage	-0.0051	0.0044	0.0035	0.0010
	(0.0189)	(0.0132)	(0.0136)	(0.0149)
Elasticity	[-0.038]	[0.033]	[0.025]	[0.007]
N	1,651,463	1,651,463	1,651,463	1,651,463
State Macroeconomic Controls and Model Choice:				
Unemployment Rate	Y	N	N	N
Per Capita GDP	Y	N	N	N
Housing Price Index	N	Y	Y	Y
College Grad Unemployment Rate	N	N	Y	Y
College Grad Average Hourly Wage	N	N	Y	Y
Model Choice	Dube	Dube	Dube	BMS

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates in columns (1) through (4) are from the March 2011 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age. The Dube model includes GDP per capita, EITC supplement, and unemployment rate. The Burkhauser, McNichols, and Sabia (BMS) model includes maximum Temporary Assistance for Needy Families (TANF), Earned Income Tax Credit (EITC) refundable rate, Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, Affordable Care Act (ACA) Medicaid expansion, housing price index, high skilled wage, and high skilled unemployment rate. It also does not disaggregate sub-families from primary families.

Table 8A. Heterogeneity in Estimated Contemporaneous Minimum Wage Effects, by Income-to-Needs Cutoff and Demographic Group, 2010-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
INR<0.5	0.0013	0.0005	-0.0003	0.0028	0.0051	0.0038	-0.0121	-0.0002
	(0.0083)	(0.0074)	(0.0066)	(0.0130)	(0.0249)	(0.0296)	(0.0175)	(0.0172)
Elasticity	*[0.0200]*	*[0.0075]*	*[-0.0049]*	*[0.0323]*	*[0.0542]*	*[0.0217]*	*[-0.1193]*	*[-0.0025]*
INR<1.0	-0.0009	-0.0035	-0.0062	-0.0053	0.0218	-0.0053	-0.0252	0.0020
	(0.0166)	(0.0146)	(0.0139)	(0.0219)	(0.0472)	(0.0407)	(0.0305)	(0.0279)
Elasticity	*[-0.0059]*	*[-0.0260]*	*[-0.0495]*	*[-0.0271]*	*[0.1108]*	*[-0.0158]*	*[-0.1089]*	*[0.0099]*
INR<1.5	0.0091	0.0092	-0.0007	0.0063	0.0237	-0.0183	0.0019	0.0238
	(0.0221)	(0.0192)	(0.0188)	(0.0304)	(0.0603)	(0.0462)	(0.0352)	(0.0343)
Elasticity	*[0.0394]*	*[0.0407]*	*[-0.0037]*	*[0.0204]*	*[0.0773]*	*[-0.0381]*	*[0.0053]*	*[0.0754]*
N	1,651,463	1,893,930	1,197,322	965,087	90,214	88,059	520,275	454,141

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. The family is the resource sharing unit. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.

Table 8B. Long-Run Poverty Effects of the Minimum Wage, by Demographic Group, Using Family as Resource Sharing Unit, 2010-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
INR<0.5	0.0105	0.0080	0.0023	0.0200	0.0219	0.0419	0.0152	0.0306
	(0.0106)	(0.0095)	(0.0078)	(0.0192)	(0.0258)	(0.0454)	(0.0303)	(0.0234)
Elasticity	*[0.1594]*	*[0.1319]*	*[0.0391]*	*[0.2315]*	*[0.2325]*	*[0.2365]*	*[0.1496]*	*[0.3436]*
INR<1.0	0.0010	-0.0046	-0.0099	-0.0012	0.0503	0.0768	-0.0120	0.0219
	(0.0149)	(0.0145)	(0.0133)	(0.0236)	(0.0528)	(0.0569)	(0.0411)	(0.0302)
Elasticity	*[0.0068]*	*[-0.0341]*	*[-0.0784]*	[-0.0061]	*[0.2556]*	*[0.2296]*	*[-0.0517]*	*[0.1097]*
INR<1.5	-0.0075	-0.0083	-0.0210	-0.0260	0.0328	-0.0397	-0.0367	0.0198
	(0.0191)	(0.0168)	(0.0176)	(0.0292)	(0.0722)	(0.0589)	(0.0402)	(0.0325)
Elasticity	*[-0.0325]*	*[-0.0367]*	*[-0.1030]*	[-0.0839]	*[0.1067]*	*[-0.0826]*	*[-0.1003]*	*[0.0628]*
N	1,651,463	1,893,930	1,197,322	965,087	90,214	88,059	520,275	454,141

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.

Table 8C. Long-Run Poverty Effects of the Minimum Wage, by Demographic Group, Using Household as Resource Sharing Unit, 2010-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
INR<0.5	0.0034	0.0011	-0.0023	0.0104	0.0027	-0.0241	-0.0119	0.0174
	(0.0087)	(0.0072)	(0.0072)	(0.0147)	(0.0194)	(0.0314)	(0.0228)	(0.0193)
Elasticity	*[0.0686]*	*[0.0248]*	*[-0.0552]*	[0.1557]	*[0.0386]*	*[-0.2065]*	*[-0.1454]*	*[0.2316]*
INR<1.0	-0.0016	-0.0069	-0.0160	-0.0039	0.0026	0.0126	-0.0227	0.0335
	(0.0159)	(0.0144)	(0.0152)	(0.0242)	(0.0471)	(0.0451)	(0.0356)	(0.0319)
Elasticity	*[-0.0132]*	*[-0.0594]*	*[-0.1568]*	[-0.0229]	*[0.0155]*	*[0.0476]*	*[-0.1092]*	*[0.1808]*
INR<1.5	-0.0032	-0.0062	-0.0186	-0.0196	0.0017	-0.0637	-0.0335	0.0323
	(0.0221)	(0.0193)	(0.0207)	(0.0326)	(0.0738)	(0.0572)	(0.0429)	(0.0368)
Elasticity	*[-0.0156]*	*[-0.0303]*	*[-0.1051]*	[-0.0685]	*[0.0062]*	*[-0.1556]*	*[-0.0982]*	*[0.1070]*
N	1,651,463	1,893,930	1,197,322	965,087	90,214	88,059	520,275	454,141

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS household weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.

Table 9. Sensitivity of Poverty Estimates to Controls for State-Specific Linear Time Trends and Census Division-Specific Year Fixed Effects ("Close Controls"), 2010-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
	Panel I: Contemporaneous Effects							
Minimum Wage	-0.0170	-0.0161	-0.0167	-0.0236	-0.0038	0.0220	-0.0234	-0.0229
	(0.0160)	(0.0137)	(0.0145)	(0.0221)	(0.0472)	(0.0350)	(0.0310)	(0.0248)
Elasticity	*[-0.1185]*	*[-0.1186]*	*[-0.1325]*	*[-0.1216]*	*[-0.0194]*	*[0.0658]*	*[-0.1010]*	*[-0.1148]*
	Panel II: Long-Run Effects							
Minimum Wage	0.013	0.0091	0.0026	0.0202	0.0440	0.0585	-0.0290	0.0262
	(0.029)	(0.0248)	(0.0280)	(0.0412)	(0.0819)	(0.0676)	(0.0607)	(0.0423)
Elasticity	*[0.089]*	*[0.062]*	*[0.018]*	*[0.108]*	*[0.225]*	*[0.221]*	*[-0.124]*	*[0.160]*
N	1,651,463	1,893,930	1,197,322	965,087	90,214	88,059	520,275	454,141

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansion. Spatial heterogeneity control includes state specific linear time trends and census division year effects.

Table 10A. Contemporaneous Minimum Wage Effects, Full Period 1983-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
INR<0.5	0.0017	0.0013	0.0017	-0.0026	0.0228*	0.0238	0.0053	0.0012
	(0.0051)	(0.0042)	(0.0037)	(0.0074)	(0.0126)	(0.0229)	(0.0141)	(0.0110)
Elasticity	[0.028]	[0.024]	[0.033]	[-0.033]	[0.241]	[0.136]	[0.048]	[0.013]
INR<1.0	-0.0036	-0.0015	0.0006	-0.0152	0.0467	-0.0249	-0.0071	-0.0184
	(0.0081)	(0.0077)	(0.0078)	(0.0118)	(0.0294)	(0.0215)	(0.0219)	(0.0112)
Elasticity	[-0.026]	[-0.011]	[0.005]	[-0.083]	[0.230]	[-0.072]	[-0.028]	[-0.092]
INR<1.5	0.0112	0.0156	0.0120	0.0047	0.0798***	-0.0215	-0.0050	0.0050
	(0.0108)	(0.0096)	(0.0105)	(0.0140)	(0.0279)	(0.0238)	(0.0234)	(0.0148)
Elasticity	[0.050]	[0.069]	[0.062]	[0.016]	[0.252]	[-0.044]	[-0.013]	[0.016]
N	5,774,313	6,524,964	4,140,327	3,694,165	382,149	288,543	1,567,893	1,633,983

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansion.

Table 10B. Long-Run Poverty Effects, Full Period 1983-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
INR<0.5	0.0070	0.0053	0.0049	0.0037	0.0262	0.0389	0.0145	0.0109
	(0.0082)	(0.0067)	(0.0057)	(0.0127)	(0.0158)	(0.0302)	(0.0248)	(0.0176)
Elasticity	[0.116]	[0.096]	[0.096]	[0.047]	[0.277]	[0.223]	[0.131]	[0.125]
INR<1.0	0.0016	0.0023	0.0052	-0.0100	0.0362	-0.0237	0.0099	-0.0154
	(0.0118)	(0.0111)	(0.0112)	(0.0169)	(0.0225)	(0.0340)	(0.0352)	(0.0169)
Elasticity	[0.012]	[0.017]	[0.045]	[-0.055]	[0.178]	[-0.068]	[0.039]	[-0.077]
INR<1.5	0.0221	0.0260*	0.0222	0.0172	0.0847***	-0.0352	0.0084	0.0123
	(0.0154)	(0.0138)	(0.0158)	(0.0197)	(0.0261)	(0.0306)	(0.0305)	(0.0197)
Elasticity	[0.098]	[0.115]	[0.114]	[0.059]	[0.268]	[-0.072]	[0.021]	[0.039]
N	5,774,313	6,524,964	4,140,327	3,694,165	382,149	288,543	1,567,893	1,633,983

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansion.

Table 10C. Sensitivity of Longer-Run Poverty Estimates to Use of Household as Resource Sharing Unit, 1983-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
INR<0.5	0.0044	0.0034	0.0034	0.0001	-0.0009	0.0330	0.0091	0.0071
	(0.0070)	(0.0058)	(0.0046)	(0.0096)	(0.0169)	(0.0302)	(0.0224)	(0.0170)
Elasticity	[0.074]	[0.061]	[0.067]	[0.002]	[-0.010]	[0.189]	[0.082]	[0.081]
INR<1.0	0.0027	0.0037	0.0048	-0.0022	0.0066	-0.0013	0.0091	-0.0067
	(0.0107)	(0.0100)	(0.0095)	(0.0164)	(0.0186)	(0.0276)	(0.0344)	(0.0178)
Elasticity	[0.020]	[0.027]	[0.041]	[-0.012]	[0.032]	[-0.004]	[0.036]	[-0.034]
INR<1.5	0.0233	0.0265*	0.0232	0.0248	0.0642**	-0.0126	0.0135	0.0172
	(0.0157)	(0.0143)	(0.0155)	(0.0238)	(0.0279)	(0.0266)	(0.0324)	(0.0197)
Elasticity	[0.103]	[0.117]	[0.119]	[0.085]	[0.203]	[-0.026]	[0.034]	[0.055]
N	5,774,984	6,525,635	4,140,327	2,060,668	382,149	288,542	1,568,118	1,634,655

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansion.

Table 11. Sensitivity of Estimated Long-Run Poverty Effects for Non-Elderly Individuals to Specification Choices, Full Period 1983-2019

	(1)	(2)	(3)	(4)	(5)	(6)
	Resource Sharing Unit: Family			Resource Sharing Unit: Household		
	Panel I: Dube (2013) Model and Macroeconomic Controls					
Minimum Wage	-0.0141	-0.0171	-0.0197	-0.0145	-0.0188	-0.0152
	(0.0149)	(0.0155)	(0.0140)	(0.0127)	(0.0119)	(0.0122)
Elasticity	[-0.102]	[-0.129]	[-0.143]	[-0.105]	[-0.136]	[-0.110]
	Panel II: Preferred (BMS) Model					
Minimum Wage	0.0016	0.0043	0.0049	0.0027	0.0055	0.0071
	(0.0118)	(0.0127)	(0.0096)	(0.0107)	(0.0117)	(0.0094)
Elasticity	[0.012]	[0.031]	[0.035]	[0.020]	[0.040]	[0.051]
	5,774,313	5,774,313	5,774,313	5,774,984	5,774,984	5,774,984
Great Recession State Dummies	N	Y	N	N	Y	N
State-Specific Linear Time Trend	N	N	Y	N	N	Y

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age. The Dube model includes GDP per capita, EITC supplement, and unemployment rate. The Burkhauser, McNichols, and Sabia (BMS) model includes maximum Temporary Assistance for Needy Families (TANF), Earned Income Tax Credit (EITC) refundable rate, Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions, and housing price index. It also does not disaggregate sub-families from primary families.

Table 12. Estimated Effect of Minimum Wages on Labor Market Outcomes, 1983-2019

	Log (Wage)	Employment	Usual Work Hours | Employment
Ages 16-to-24 with ≤ HS degree	0.0772**	-0.0679**	-1.2021
	(0.0319)	(0.0293)	(1.1663)
Elasticity	[0.077]	[-0.144]	[-0.038]
N	494,397	1,191,487	533,909
Ages 16-to-24 with < HS degree	0.0687**	-0.1092***	-1.6965
	(0.0319)	(0.0378)	(1.2042)
Elasticity	[0.069]	[-0.273]	[-0.058]
N	301,962	836,703	327,106
Single Mothers Ages 16-to-55 with < HS degree	0.0989*	0.0911	-1.4931
	(0.0559)	(0.0972)	(2.1272)
Elasticity	[0.099]	[0.183]	[-0.041]
N	19,453	50,013	24,110
Ages 30+ with ≥ HS degree	-0.0354	-0.0143	-0.3743
	(0.0335)	(0.0095)	(0.2946)
Elasticity	[-0.035]	[-0.022]	[-0.009]
	1,881,134	6,589,208	3,951,990
Age 16-64 Blacks or Hispanics	-0.0560	-0.0248	-1.5669***
	(0.0514)	(0.0216)	(0.3306)
Elasticity	[-0.056]	[-0.044]	[-0.041]
N	825,906	2,278,303	1,178,544

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the 1983-2019 Outgoing Rotation Groups. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, a cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.

Table 13A. Wage Distribution of All Workers by Income-to-Needs Ratio of Their Families, 2019-2020

	Hourly Wage Categories[a]									
Income-to-Needs Ratio	$0.01 to $6.99	$7.00 to $7.24	$7.25 to $10.99	$11.00 to $14.99	$15.00 to $19.99	$20.00 and over	Total	Percent of All Workers	Percent of Workers Earning More than $6.99 and Less Than $11.00	Percent of Workers Earning More than $6.99 and Less Than $15.00
Less than 1.00	4.85	0.32	31.14	30.68	19.55	13.46	100.00	4.58	11.86	7.97
1.00 to 1.24	3.06	0.26	19.39	38.52	23.74	15.03	100.00	2.58	4.43	4.41
1.25 to 1.49	5.02	0.13	22.72	35.78	19.94	16.40	100.00	2.76	6.31	5.38
1.50 to 1.99	2.33	0.16	16.88	35.21	25.05	20.38	100.00	7.33	12.98	13.38
2.00 to 2.99	1.66	0.19	11.63	26.41	29.57	30.54	100.00	15.20	18.58	21.01
3.00 or above	1.11	0.11	5.86	12.44	17.49	63.00	100.00	67.56	45.82	47.85
Whole Category Share[b]	1.54	0.13	9.04	17.80	20.03	51.45	100.00	100.00	100.00	100.00

[a]Hourly wage rates are based on a direct question concerning earnings per hour on their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. The sample is restricted to those who report employment for at least 10 weeks last year for at least 10 hours per week (steady employment).

[b]Share of all workers with wage earnings in each category

Source: Wages are estimated from the outgoing rotation group of the Current Population Survey for years 2018-2019 and the income-to-needs ratios of households from the 2019 to 2020 March CPS (corresponding to calendar years 2018-2019).

Table 13B. Wage Distribution of All Workers by Income-to-Needs Ratio of Their Households, 2019-2020 March CPS

	Hourly Wage Categories[a]									
Income-to-Needs Ratio	$0.01 to $6.99	$7.00 to $7.24	$7.25 to $10.99	$11.00 to $14.99	$15.00 to $19.99	$20.00 and over	Total	Percent of All Workers	Percent of Workers Earning More than $6.99 and Less Than $11.00	Percent of Workers Earning More than $6.99 and Less Than $15.00
Less than 1.00	5.43	0.00	31.02	29.47	19.30	14.78	100.00	3.62	8.76	5.89
1.00 to 1.24	2.75	0.29	20.37	39.02	23.74	13.83	100.00	2.19	4.02	3.99
1.25 to 1.49	3.92	0.15	22.87	33.81	21.58	17.68	100.00	2.55	5.65	4.73
1.50 to 1.99	2.71	0.15	18.72	33.42	24.71	20.29	100.00	6.39	12.07	11.25
2.00 to 2.99	1.67	0.21	12.72	27.33	27.69	30.37	100.00	14.52	19.20	20.52
3.00 or above	1.19	0.12	6.13	13.40	18.16	61.00	100.00	70.73	50.31	53.63
Whole Category Share[b]	1.54	0.13	9.04	17.80	20.03	51.45	100.00	100.00	100.00	100.00

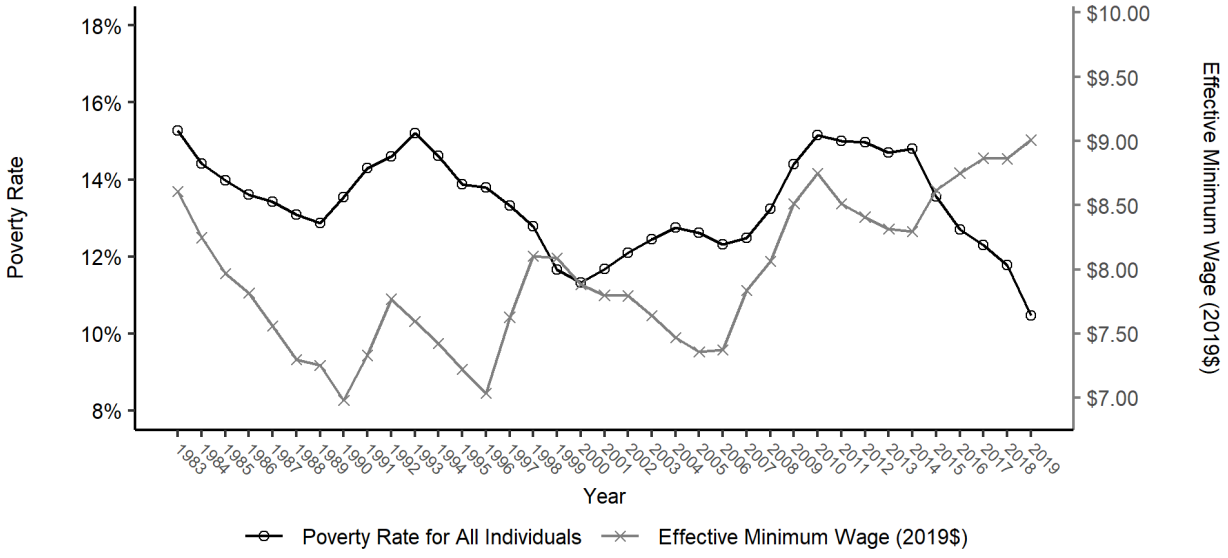
Notes:

[a]Hourly wage rates are based on a direct question concerning earnings per hour on their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. The sample is restricted to those who report employment for at least 10 weeks last year for at least 10 hours per week (steady employment).

[b]Share of all workers with wage earnings in each category

Source: Wages are estimated from the outgoing rotation group of the Current Population Survey for years 2018-2019 and the income-to-needs ratios of households from the 2019 to 2020 March CPS (corresponding to calendar years 2018-2019).

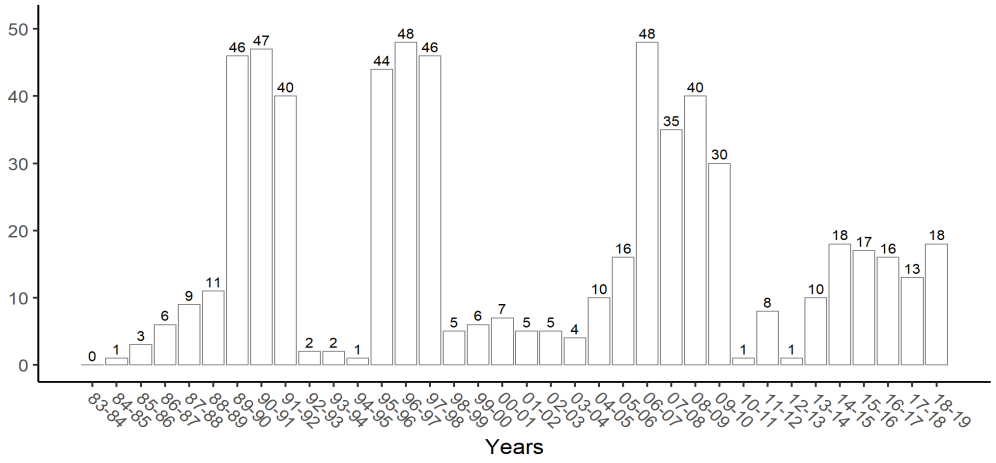
Appendix Figure 1. Effective Real Minimum Wage (2019$) and Poverty Rate, All Individuals, 1983-2019



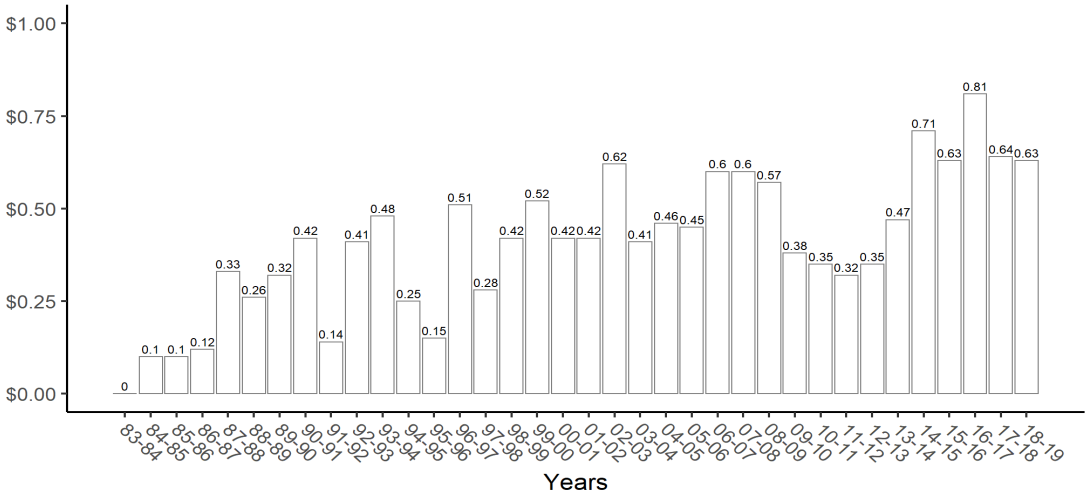
Note: Poverty rate in this figure is measured using official poverty measure.

Appendix Figure 2. Frequency and Magnitude of Nominal State Minimum Wage Increases >=2.5% of Prior Year, 1983-2019

Panel (a): Number of Minimum Wage Increases



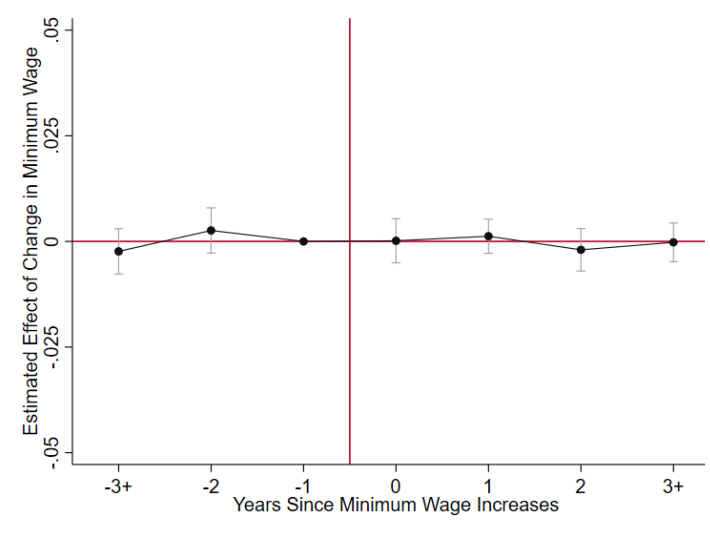
Panel (b): Average Magnitude of Nominal Increase Among States that Increase MW



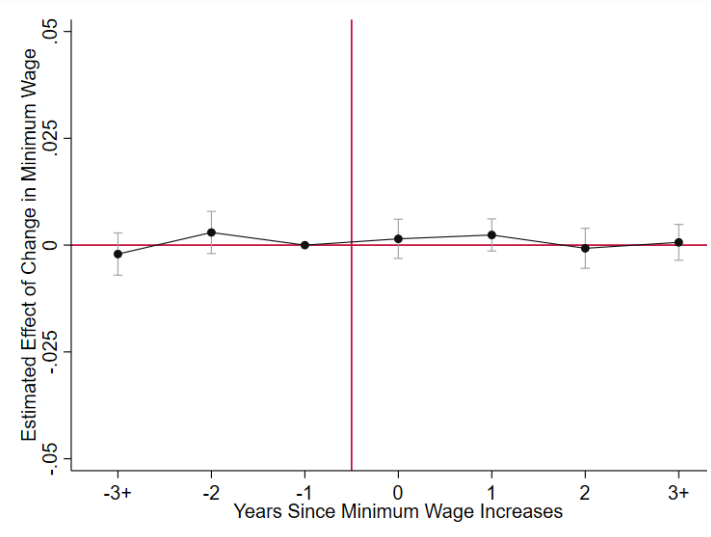
Note: Magnitudes are based on average year-over-year increases.

Appendix Figure 3. Event-Study Analyses of Minimum Wage Increases and Poverty, 1983-2012

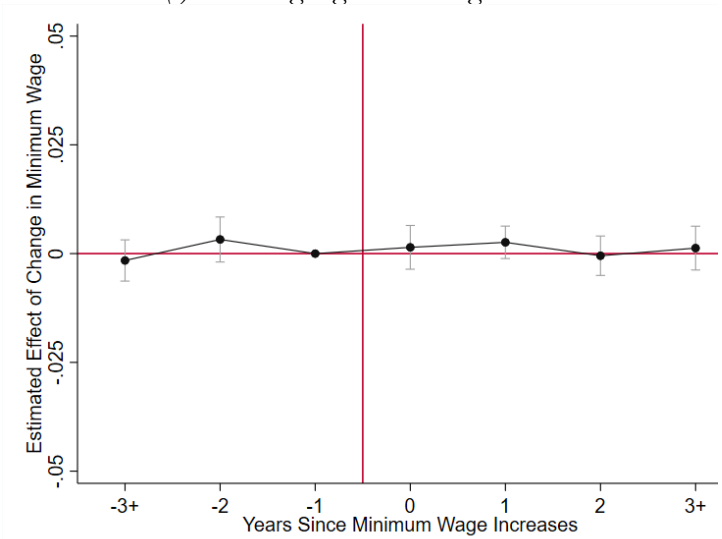
Panel (a): All Non-Elderly



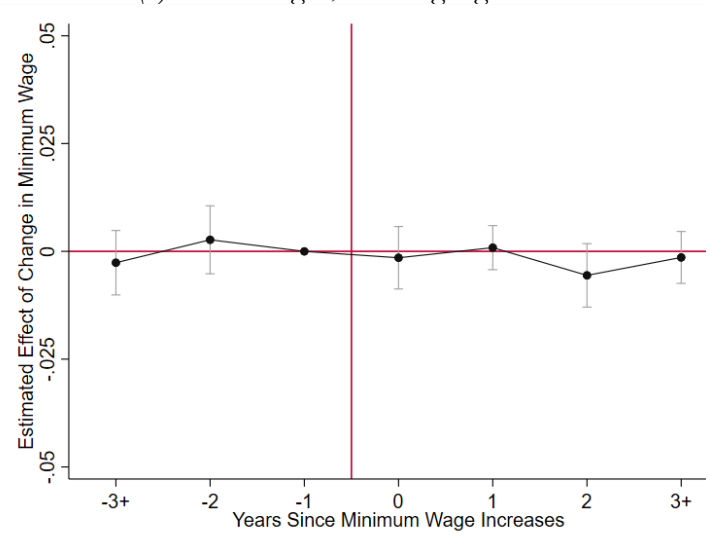
Panel (b): All Individuals, Including Elderly



Panel (c): Working-Age Adults Ages 16-64

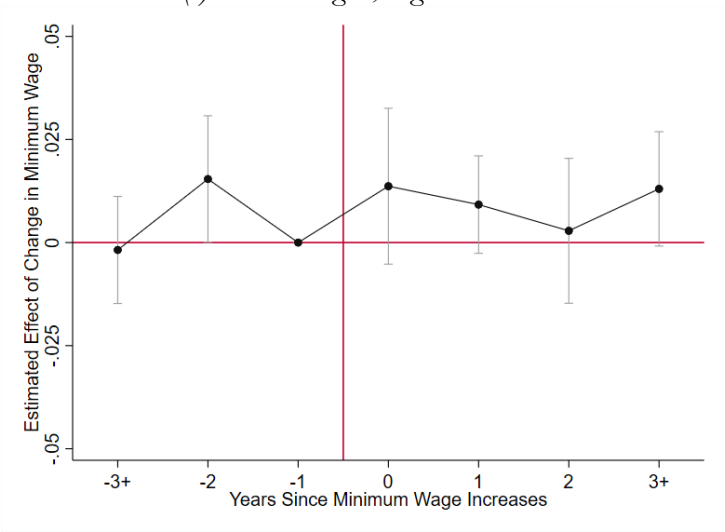


Panel (d): ≤ HS Degree, Working-Age Adults

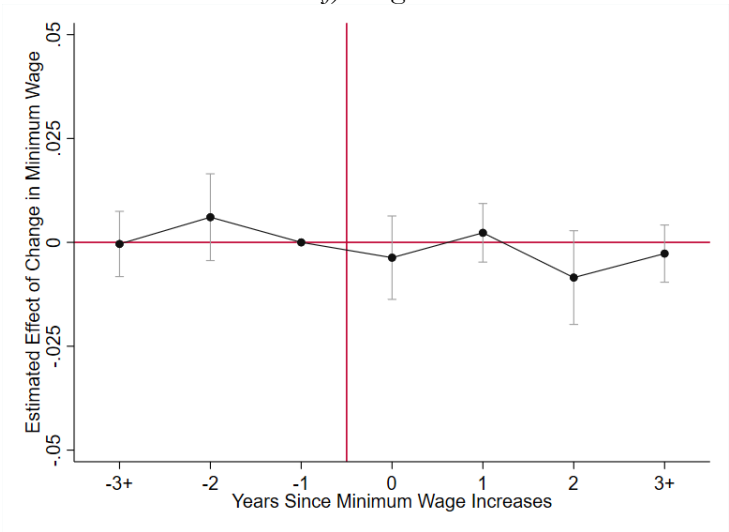


Appendix Figure 4, Continued

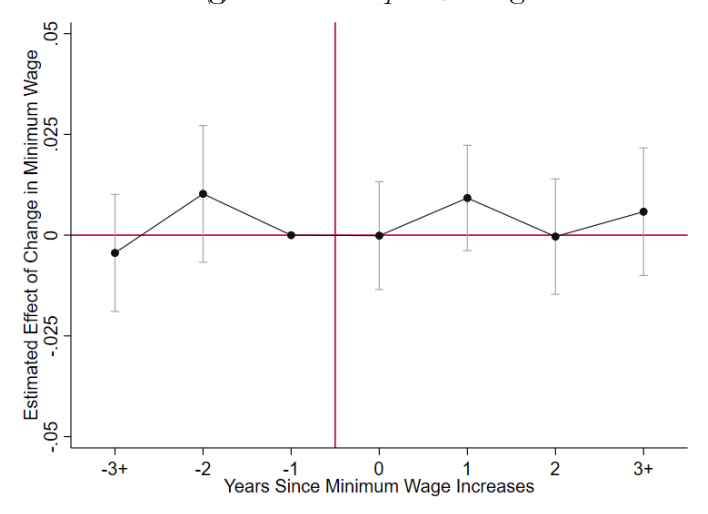
Panel (e): < HS Degree, Ages 16-24



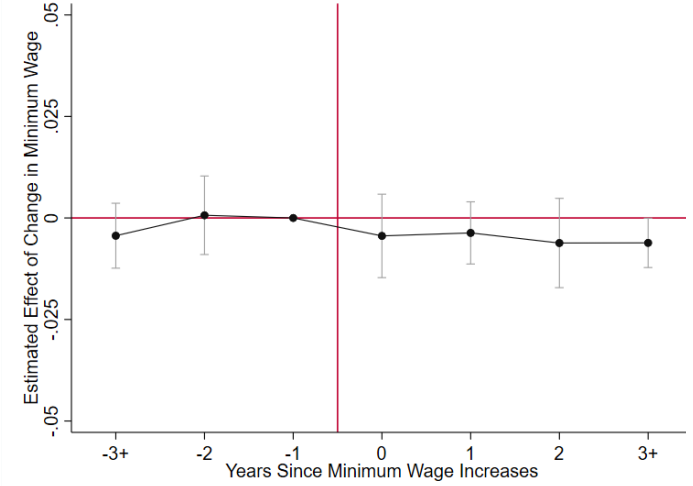
Panel (f): Single Mothers



Panel (g): Black or Hispanic, < Age 65

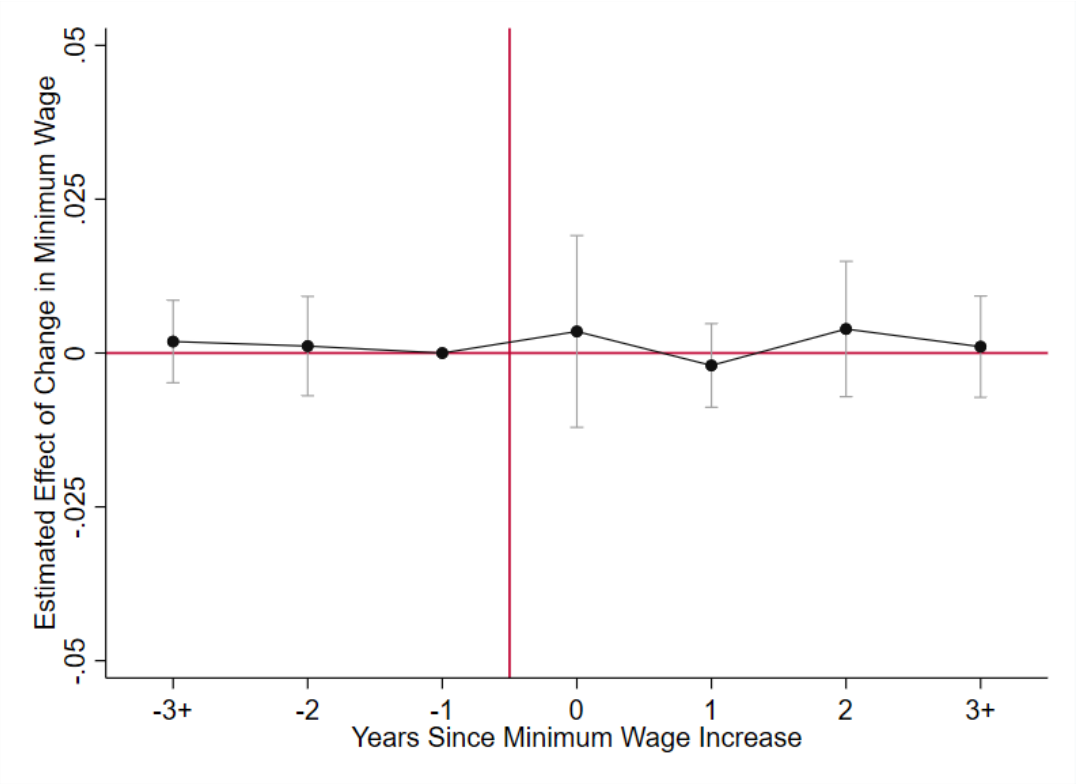


Panel (h): Children < Age 16



Notes: Data used to generate estimates are from the March 2011 through March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. Demographic controls include indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, and a cubic in age. Macroeconomic controls include housing price index, unemployment rate and wage rate for those with a college degree or higher. Social welfare policy controls include the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.

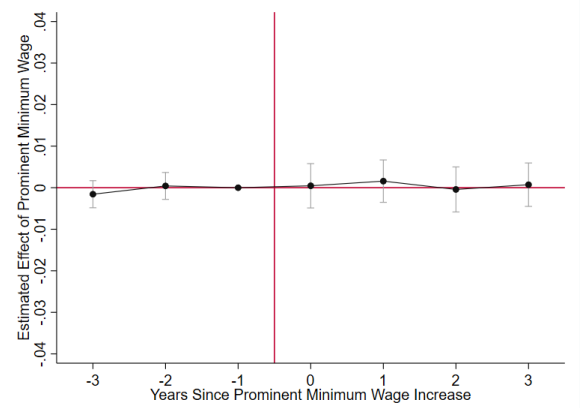
Appendix Figure 4. Sensitivity of Poverty Effects to Use of Supplemental Poverty Measure, All Non-Elderly, 2010-2019



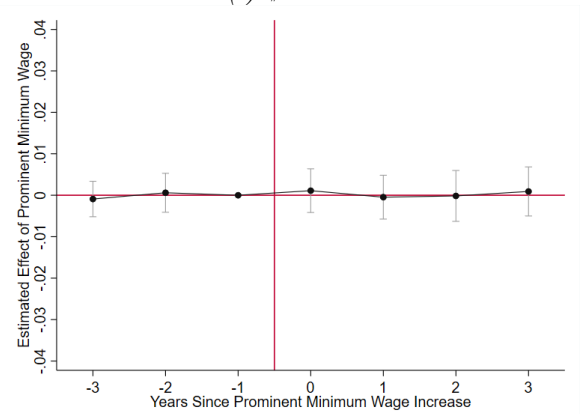
Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. Demographic controls include indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, and a cubic in age. Macroeconomic controls include housing price index, unemployment rate and wage rate for those with a college degree or higher. Social welfare policy controls include the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.

Appendix Figure 5. Event-Study Analyses of Prominent State & Federal MW Increases, Using Stacked Difference-in-Differences Estimates, 1983-2019, Counterfactuals are Not-Yet Adopters of Prominent MWs

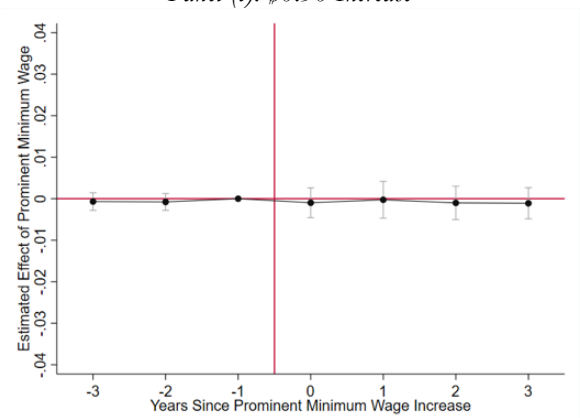
Panel (a): $0.75 Increase



Panel (b): $1.00 Increase



Panel (c): $0.50 Increase



Notes: Estimates are generated using a stacked difference-in-difference approach following Cengiz et al. (2019). Control states are restricted to states that had not yet enacted a prominent MW increase during the event window nor had they enacted an increase of $0.50 or higher (including Federal increases). All regressions include state and year fixed effects and are weighted using the CPS person weight. All estimates include the full set of controls from our fully saturated model. In addition, panels (a) and (b) include controls for smaller minimum wage increases of 10 to 50 cents, and panels (c) include controls for smaller minimum wage increases of 10 to 25 cents. The bar lines represent 95% confidence intervals generated using standard errors clustered at the state-level.

Appendix Table 1. Mean Poverty Rates, Using OPM Measure

	Non-Elderly, < 65	*All (Including Elderly)*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers, 16-55*	*Black or Hispanic, < 65*	*Children Under Age 16*
				Panel I: Dube (2019) Sample Period, 1983-2012			
INR<0.5	0.0549	0.0510	0.0738	0.0928	0.1044	0.1122	0.0892
INR<1.0	0.1301	0.1270	0.1755	0.2053	0.2297	0.2585	0.2028
INR<1.5	0.2134	0.2170	0.2829	0.3174	0.3467	0.3968	0.3152
INR<2.0	0.3003	0.3097	0.3895	0.4215	0.4558	0.5163	0.4237
INR<3.0	0.4722	0.4867	0.5833	0.6019	0.6425	0.6948	0.6160
N	4,662,782	5,238,863	3,019,445	262,481	965,823	1,211,366	1,330,246
				Panel II: Post-Great Recession Era, 2010-2019			
INR<0.5	0.0660	0.0608	0.0862	0.0943	0.1771	0.1018	0.0892
INR<1.0	0.1435	0.1360	0.1944	0.1970	0.3344	0.2315	0.1997
INR<1.5	0.2311	0.2267	0.3106	0.3070	0.4807	0.3656	0.3157
INR<2.0	0.3181	0.3175	0.4187	0.4091	0.6046	0.4845	0.4185
INR<3.0	0.4758	0.4791	0.5946	0.5765	0.7704	0.6639	0.5828
N	1,651,463	1,893,930	965,087	90,214	88,059	520,275	454,141
				Panel III: Full Period, 1983-2019			
INR<0.5	0.0603	0.0559	0.0780	0.0945	0.1747	0.1107	0.0873
INR<1.0	0.1381	0.1336	0.1820	0.2032	0.3466	0.2531	0.1992
INR<1.5	0.2249	0.2260	0.2930	0.3162	0.4910	0.3927	0.3126
INR<2.0	0.3141	0.3201	0.4014	0.4224	0.6113	0.5141	0.4200
INR<3.0	0.4856	0.4956	0.5930	0.6049	0.7816	0.6943	0.6062
N	5,774,315	6,524,964	3,694,167	382,149	288,546	1,567,894	1,633,986

Note: Data used to generate estimates are from the March 2011 to March 2020 CPS. The means are weighted using the CPS population weight.

Appendix Table 2A. Percent of Younger, Less Educated Individuals or Single Mothers Employed, Earning a Low Wage, or Earning at or Near Minimum Wage, by Income-to-Needs Ratios of Families or Households, 1983-2019

Income-to-Needs Ratio	% Working	% Steady Employment	Annual Work Hours	% Employed and Earning Low Wage	% Employed and Earning Min Wage	Min Wage Annual Work Hours | Min Wage Workers
	(1)	(2)	(3)	(4)	(5)	(6)
Panel I: Ages 16-to-24 with Less than HS Degree, RSU = Family						
Less than 0.50	28.7	19.1	177	26.6	13.0	799
0.50 to 0.99	38.7	30.4	373	38.3	13.6	1,101
1.00 to 1.49	44.8	36.4	501	35.7	12.9	1,262
1.50 or above	52.8	41.7	515	31.3	11.8	872
Panel II: Ages 16-to-24 with Less than HS Degree, RSU = Household						
Less than 0.50	25.7	16.5	161	28.3	13.4	896
0.50 to 0.99	34.9	26.1	311	31.7	12.5	997
1.00 to 1.49	42.5	33.6	436	35.4	12.4	1,156
1.50 or above	53	42	523	31.8	12	893
Panel III: Single Mothers, RSU = Family						
Less than 0.50	35.1	25.9	274	23.1	8.4	978
0.50 to 0.99	64.7	59.8	879	31.2	6.8	1,583
1.00 to 1.49	81.9	79.4	1,397	23.8	4.8	1,734
1.50 or above	91.7	90.2	1,803	9.1	1.6	1,753
Panel IV: Single Mothers, RSU = Household						
Less than 0.50	35.8	26.7	289	25	9.0	965
0.50 to 0.99	60.2	54.8	806	29.9	6.9	1,622
1.00 to 1.49	76.3	73.1	1,262	22.7	4.5	1,655
1.50 or above	89.2	87.3	1,713	10.7	2.0	1,682

Source: Current Population Survey, March 1984 through 2013

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. All estimates are weighted. The sample is restricted to individuals ages 16 to 64. A worker is defined as an individual who works a positive number of hours in the last year. A steady worker is defined as an individual that worked at least 10 weeks last year and at least 10 hours a week. Columns (1) through (3) uses data from the full March CPS. Columns (4) through (6) uses data from the Outgoing Rotation Groups (so as to construct hourly wage rates). A low-wage worker is defined as an individual whose wages fall below 50% of the national average private wage for a given year. A minimum wage worker is defined as in individual whose wage is 25 cents below and 50 cents above the binding state minimum wage.

Appendix Table 2B. Percent of Working-Age Individuals (Ages 16-to-64) Employed, Earning a Low Wage, or Earning at or Near Minimum Wage, by Income-to-Needs Ratios of Families or Households, 2010-2019

	% Employed	% Steady Employment	Annual Work Hours	% Employed and Earning Low Wage	% Employed and Earning Min Wage	Min Wage Annual Work Hours | Min Wage Workers
	(1)	(2)	(3)	(4)	(5)	(6)
Income-to-Needs Ratio						
				Panel I: Families		
Less than 0.50	27.1	20.6	221	21.6	6.4	903
0.50 to 0.99	49.7	45.7	665	30	7.9	1,407
1.00 to 1.49	63.2	60.2	1,016	26	6.2	1,561
1.50 or above	83.4	81.4	1,657	10.1	2	1,502
				Panel II: Households		
Less than 0.50	27.3	21	240	21.5	6.1	930
0.50 to 0.99	44.4	40.5	605	27.8	7.4	1,433
1.00 to 1.49	57.1	53.7	905	24.4	5.6	1,464
1.50 or above	82	79.8	1,614	10.6	2.2	1,497

Source: Current Population Survey, March 2011 through 2013

Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. All estimates are weighted. The sample is restricted to individuals ages 16 to 64. A worker is defined as an individual who works a positive number of hours in the last year. A steady worker is defined as an individual that worked at least 10 weeks last year and at least 10 hours a week. Columns (1) through (3) uses data from the full March CPS. Columns (4) through (6) uses data from the Outgoing Rotation Groups (so as to construct hourly wage rates). A low-wage worker is defined as an individual whose wages fall below 50% of the national average private wage for a given year. A minimum wage worker is defined as in individual whose wage is 25 cents below and 50 cents above the binding state minimum wage.

Appendix Table 3. Sensitivity of Estimates to Accounting for Local (City and County) Minimum Wages in Calculation of Effective State Minimum Wage

	1983-2012		2010-2019		1983-2019	
	(1)	(2)	(3)	(4)	(5)	(6)
Minimum Wage	0.001	0.002	-0.001	-0.004	0.009	0.001
	(0.011)	(0.011)	(0.014)	(0.015)	(0.013)	(0.010)
Elasticity	[0.004]	[0.016]	[-0.004]	[-0.034]	[0.062]	[0.011]
N	4,662,781	4663452	1,651,463	1,651,463	5,774,313	5,774,984
Resource Sharing Unit	Family	Household	Family	Household	Family	Household

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS for columns 1 and 2, March 2011 to March 2020 CPS for columns 3 and 4, and the March 1984 to March 2020 CPS for columns 5 and 6. All regressions include state and year fixed effects and are weighted using the CPS household weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.

Appendix Table 4. Sensitivity of Dube's Results Using His Macroeconomic Controls to Inclusion of Great Recession-Specific Year Effects, State Linear Time Trends, and Census Division-Specific Year Fixed Effects (Forcing "Close Controls"), 1983-2012

	(1)	(2)	(3)	(4)	(5)
			Panel I: Contemporaneous Effects		
Minimum Wage	-0.0101	-0.0102	-0.0094	-0.0340**	-0.0315**
	(0.0084)	(0.0084)	(0.0078)	(0.0129)	(0.0145)
Elasticity	[-0.074]	[-0.075]	[-0.069]	[-0.250]	[-0.232]
			Panel II: Long-Run Effects		
Minimum Wage	-0.0299**	-0.0379***	-0.0308***	-0.0421**	-0.0605***
	(0.0114)	(0.0110)	(0.0104)	(0.0195)	(0.0186)
Elasticity	[-0.220]	[-0.279]	[-0.227]	[-0.310]	[-0.446]
N	4,662,781	4,662,781	4,662,781	4,662,781	4,662,781
Great Recession State Dummies	N	Y	N	N	Y
State-Specific Linear Time Trend	N	N	Y	N	Y
Census Division Specific Year Effect	N	N	N	Y	Y

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, a cubic in age and per capita state Gross Domestic Product (GDP) and the state unemployment rate.

Appendix Table 5. Sensitivity of Synthetic Control Analysis to Longer Four-Year Pre-Treatment Period, 1983-2012

	Proportion of weight on states in same division					
	Match on Poverty Rate in Each Pre-Treat Year	Match on Mean Pre-Treat Poverty Rate & Preferred Macro Trends	Match on Mean Pre-Treat Poverty Rate & Dube's Macro Trends	Match on Mean Pre-Treat Poverty Rate, Preferred Macro Trends, & Policies	Average number of donor states	Average number of donor states in same division
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel I: $0.75 Minimum Wage Increase			
East North Central	0.000	0.144	0.000	0.055	38.000	3.000
Middle Atlantic	0.015	0.000	0.000	0.000	38.000	1.000
New England	0.201	0.605	0.602	0.400	4.667	1.667
Pacific	0.331	0.191	0.439	0.000	4.000	1.667
South Atlantic	0.025	0.061	0.016	0.349	39.200	6.600
			Panel II: $1.00 Minimum Wage Increase			
East North Central	0.000	0.144	0.000	0.055	38.000	3.000
New England	0.000	0.486	0.500	0.000	5.000	2.000
South Atlantic	0.127	0.167	0.079	0.349	4.000	1.000
			Panel III: $0.50 Minimum Wage Increase			
East North Central	0.000	0.000	0.000	0.000	30.000	2.000
Middle Atlantic	0.018	0.000	0.000	0.000	30.000	1.000
New England	0.057	0.608	0.000	0.398	33.000	1.000
Pacific	0.150	0.171	0.161	0.000	22.750	1.500
South Atlantic	0.003	0.041	0.018	0.046	38.000	6.846
			Panel IV: $0.10 Minimum Wage Increase			
East North Central	0.174	0.108	0.000	0.034	31.800	2.600
Middle Atlantic	0.210	0.327	0.417	0.150	17.000	1.000

	Proportion of weight on states in same division				Average number of donor states	Average number of donor states in same division
	Match on Poverty Rate in Each Pre-Treat Year	Match on Mean Pre-Treat Poverty Rate & Preferred Macro Trends	Match on Mean Pre-Treat Poverty Rate & Dube's Macro Trends	Match on Mean Pre-Treat Poverty Rate, Preferred Macro Trends, & Policies		
	(1)	(2)	(3)	(4)	(5)	(6)
New England	0.235	0.250	0.014	0.298	18.500	1.500
Pacific	0.011	0.086	0.019	0.000	37.000	1.000
South Atlantic	0.011	0.049	0.025	0.050	30.000	5.615
West North Central	0.023	0.080	0.079	0.094	30.000	5.000
West South Central	0.212	0.124	0.000	0.056	23.000	3.000

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. Weights are generated using synthetic control estimate. Donor pool is comprised of states without a minimum wage increase, 4 years before the treatment, during the treatment year, and 1 year after the treatment. Preferred macro trends include pre- and post- treatment trend of housing price index, unemployment rate, and wage among high education. Dube's macro trends include pre- and post-treatment trend of unemployment rate and per capita income. Social trends include pre- and post- treatment trend of EITC and TANF benefit.

Appendix Table 6A. Synthetic Control Estimates of the Effects of Prominent Minimum Wage Increases of $0.75 or More on Poverty Among Non-Elderly Individuals, 1983-2012

State	Treatment Year	Division	Match on Poverty Rate in Each Pre-Treat Year	Match on Dube's Preferred Controls	Match on Mean Pre-Treat Poverty Rate, Macro & Policies
Alaska [a]	2004	Pacific	0.003	-0.0098	-0.0119
P-Value			[0.6744]	[0.186]	[0.2558]
California [a]	2008	Pacific	0.0131	0.0185	0.0251
P-Value			[0.2857]	[0.1429]	[0.4286]
Oregon [a]	1998	Pacific	0.024	0.0421	0.0234
P-Value			[0.5]	[0.3333]	[0.3333]
Washington [a]	2001	Pacific	0.0349	0.0261	0.0000
P-Value			[0.2]	[0.4]	[1]
Arizona	2008	Mountain	0.0239	0.0234	0.0255
P-Value			[0.1429]	[0.2857]	[0.1429]
Colorado	2008	Mountain	0.0118	-0.0003	0.0077
P-Value			[0.1429]	[0.8571]	[0.4286]
Montana	2008	Mountain	0.0003	0.0074	0.0099
P-Value			[0.8571]	[1]	[0.7143]
Nevada	2008	Mountain	0.0059	0.0001	-0.0059
P-Value			[0.1429]	[0.8571]	[0.5714]
New Mexico	2009	Mountain	0.0742	0.0751	0.0742
P-Value			[0.75]	[0.625]	[0.75]
Arkansas	2008	West South Central	0.0049	0.0305	0.026
P-Value			[0.8571]	[0.7143]	[0.8571]
District of Columbia [a]	1989	South Atlantic	0.0546	0.0536	0.000
P-Value			[0.8776]	[0.7755]	[0.1837]
Maryland [a]	2008	South Atlantic	0.0011	-0.0184	-0.0398
P-Value			[0.8571]	[0.2857]	[0.5714]
North Carolina [a]	2008	South Atlantic	0.0224	0.0307	0.0573
P-Value			[0.7143]	[0.2857]	[0.4286]
Iowa	2008	West North Central	-0.0087	-0.014	-0.0018
P-Value			[0.1429]	[0.1429]	[1]
Missouri	2008	West North Central	0.021	0.0189	0.0502
P-Value			[0.2857]	[0.1429]	[0.2857]
Illinois [a]	2006	East North Central	-0.0197	-0.0192	-0.0222
P-Value			[0.35]	[0.225]	[0.1]
Michigan	2008	East North Central	1.00E-04	0.004	-0.002
P-Value			[0.7143]	[0.5714]	[0.5714]
Ohio	2008	East North Central	0.0204	0.0179	0.0316
P-Value			[0.2857]	[0.2857]	[0.1429]
New Jersey	2007	Middle Atlantic	-0.00001	-0.0023	-0.0499
P-Value			[1]	[0.9583]	[0.7083]
New York [a]	2006	Middle Atlantic	-0.0065	0.0039	-0.0199*
P-Value			[0.275]	[0.65]	[0.075]
Pennsylvania	2008	Middle Atlantic	-0.0023	-0.009	-7.00E-04
P-Value			[0.7143]	[0.8571]	[1]
Massachusetts	2001	New England	0.0037	0.0075	-0.0019
P-Value			[0.8]	[0.6]	[0.4]

State	Treatment Year	Division	Match on Poverty Rate in Each Pre-Treat Year	Match on Dube's Preferred Controls	Match on Mean Pre-Treat Poverty Rate, Macro & Policies
Massachusetts [a]	2008	New England	0.0176	0.0092	0.0036
P-Value			[0.8571]	[0.8571]	[1]
New Hampshire [a]	2009	New England	-0.0165	-0.0153	-0.0165
P-Value			[1]	[1]	[1]

Notes: P-values are reported in [brackets]. Dube's preferred controls include pre- and post- treatment trend of GDP and unemployment rate. Macro trends include pre- and post- treatment trend of housing price index, unemployment rate, and wage among high education. Social trends include pre- and post- treatment trend of EITC and TANF benefit.

[a] States with at least one donor states within the same census division and outside.

Appendix Table 6B. Synthetic Control Estimates of the Effects of Prominent Minimum Wage Increases of $1.00 or More on Poverty Among Non-Elderly Individual, 1983-2012

State	Treatment Year	Division	Match on Poverty Rate in Each Pre-Treat Year	Match on Dube's Preferred Controls	Match on Mean Pre-Treat Poverty Rate, Macro & Policies
Alaska [a]	2004	Pacific	0.003	-0.0098	-0.0119
P-Value			[0.6744]	[0.186]	[0.2558]
Arizona	2008	Mountain	0.0239	0.0234	0.0255
P-Value			[0.1429]	[0.2857]	[0.1429]
Colorado	2008	Mountain	0.0118	-3.00E-04	0.0077
P-Value			[0.1429]	[0.8571]	[0.4286]
Montana	2008	Mountain	3.00E-04	0.0074	0.0099
P-Value			[0.8571]	[1]	[0.7143]
New Mexico	2009	Mountain	0.0742	0.0751	0.0742
P-Value			[0.75]	[0.625]	[0.75]
Maryland [a]	2008	South Atlantic	0.0011	-0.0184	-0.0398
P-Value			[0.8571]	[0.2857]	[0.5714]
North Carolina [a]	2008	South Atlantic	0.0224	0.0307	0.0573
P-Value			[0.7143]	[0.2857]	[0.4286]
Iowa	2009	West North Central	-0.0195	0.0034	0.0012
P-Value			[0.375]	[1]	[0.875]
Missouri	2008	West North Central	0.021	0.0189	0.0502
P-Value			[0.2857]	[0.1429]	[0.2857]
Illinois [a]	2006	East North Central	-0.0197	-0.0192	-0.0222
P-Value			[0.35]	[0.225]	[0.1]
Michigan	2008	East North Central	1.00E-04	0.004	-0.002
P-Value			[0.7143]	[0.5714]	[0.5714]
Ohio	2008	East North Central	0.0204	0.0179	0.0316
P-Value			[0.2857]	[0.2857]	[0.1429]
New Jersey	2007	Middle Atlantic	-1.00E-04	-0.0023	-0.0499
P-Value			[1]	[0.9583]	[0.7083]
Pennsylvania	2008	Middle Atlantic	-0.0023	-0.009	-7.00E-04
P-Value			[0.7143]	[0.8571]	[1]
New Hampshire [a]	2009	New England	-0.0165	-0.0153	-0.0165
P-Value			[1]	[1]	[1]

Notes: P-values are reported in [brackets]. Dube's preferred controls include pre- and post- treatment trend of GDP and unemployment rate. Macro trends include pre- and post- treatment trend of housing price index, unemployment rate, and wage among high education. Social trends include pre- and post- treatment trend of EITC and TANF benefit.

[a] States with at least one donor states within the same census division and outside.

Appendix Table 6C. Synthetic Control Estimates of the Effects of Prominent Minimum Wage Increases of $0.50 or More on Poverty Among Non-Elderly Individuals, 1983-2012

State	Treatment Year	Division	Match on Poverty Rate in Each Pre-Treat Year	Match on Dube's Preferred Controls	Match on Mean Pre-Treat Poverty Rate, Macro & Policies
Alaska [a]	1998	Pacific	0.0032	0.0032	0.1815
P-Value			[1]	[1]	[1]
Alaska	2004	Pacific	0.0031	-0.0051	-0.0146
P-Value			[0.6]	[0.225]	[0.325]
California [a]	1998	Pacific	0.0363	0.0382	0.2575
P-Value			[1]	[0.6667]	[1]
Hawaii [a]	1989	Pacific	0.0144	0.0215	0.0000
P-Value			[0.5909]	[0.4318]	[0.2045]
Hawaii [a]	1994	Pacific	-0.0334	-0.0153	0.0000
P-Value			[0.5]	[0.75]	[0.75]
Hawaii	2003	Pacific	0.0052	-0.0051	0.0004
P-Value			[0.2439]	[0.7073]	[0.4878]
Oregon [a]	1998	Pacific	0.0074	0.0074	0.2287
P-Value			[1]	[1]	[1]
Washington	1990	Pacific	-0.0092	-0.0119	0.0000
P-Value			[0.6]	[0.4]	[1]
Washington [a]	1995	Pacific	0.0125	0.0071	0.0000
P-Value			[0.5]	[0.5]	[1]
Washington [a]	2000	Pacific	0.0203	0.0207	0.1777
P-Value			[0.3333]	[0.3333]	[0.3333]
Arizona	1998	Mountain	0.047	0.047	0.2683
P-Value			[1]	[1]	[1]
Colorado	1998	Mountain	-0.0239	-0.0218	0.1781
P-Value			[0.3333]	[0.3333]	[1]
Idaho	1998	Mountain	0.0105	0.0105	0.2318
P-Value			[1]	[1]	[0.6667]
Montana	1998	Mountain	0.0372	0.0372	0.2584
P-Value			[1]	[1]	[0.6667]
Nevada	1998	Mountain	0.0053	0.0106	0.199
P-Value			[1]	[1]	[0.6667]
New Mexico	1998	Mountain	0.0831	0.0955	0.3043
P-Value			[1]	[0.6667]	[1]
Utah	1998	Mountain	0.0039	0.0039	0.1822
P-Value			[1]	[1]	[1]

State	Treatment Year	Division	Match on Poverty Rate in Each Pre-Treat Year	Match on Dube's Preferred Controls	Match on Mean Pre-Treat Poverty Rate, Macro & Policies
Wyoming	1998	Mountain	-0.0082	-0.0082	0.2131
P-Value			[1]	[1]	[1]
Arkansas	1998	West South Central	0.0398	0.0398	0.261
P-Value			[1]	[1]	[1]
Louisiana	1998	West South Central	0.0459	0.0714	0.2671
P-Value			[1]	[1]	[0.6667]
Oklahoma	1998	West South Central	0.0113	0.0113	0.2325
P-Value			[1]	[1]	[1]
Texas	1998	West South Central	0.0274	0.0274	0.2486
P-Value			[1]	[1]	[1]
Alabama	1998	East South Central	0.0226	0.0226	0.2439
P-Value			[1]	[1]	[1]
Kentucky	1998	East South Central	0.0164	0.0164	0.2377
P-Value			[1]	[1]	[0.6667]
Mississippi	1998	East South Central	0.036	0.0609	0.2572
P-Value			[1]	[1]	[0.6667]
Tennessee	1998	East South Central	0.0093	0.0093	0.2305
P-Value			[1]	[1]	[1]
District of Columbia [a]	1989	South Atlantic	0.0546	0.0536	0.0000
P-Value			[0.8636]	[0.75]	[0.1591]
District of Columbia	1998	South Atlantic	0.0931	0.1361	0.3144
P-Value			[1]	[1]	[1]
Florida	1998	South Atlantic	0.0142	0.0142	0.2354
P-Value			[1]	[1]	[1]
Florida [a]	2006	South Atlantic	-0.0145*	-0.0086	-0.0244
P-Value			[0.0909]	[0.4545]	[0.1212]
Georgia	1998	South Atlantic	0.012	0.012	0.2332
P-Value			[1]	[1]	[1]
Maryland	1998	South Atlantic	-0.0439	-0.0529	0.1628
P-Value			[0.6667]	[0.3333]	[0.6667]
North Carolina	1998	South Atlantic	-0.0041	-0.0041	0.2172
P-Value			[1]	[1]	[1]
South Carolina	1998	South Atlantic	0.0026	0.0026	0.2238
P-Value			[1]	[1]	[1]
Virginia	1998	South Atlantic	-0.0217	-0.0243	0.1964
P-Value			[0.6667]	[0.3333]	[1]

State	Treatment Year	Division	Match on Poverty Rate in Each Pre-Treat Year	Match on Dube's Preferred Controls	Match on Mean Pre-Treat Poverty Rate, Macro & Policies
West Virginia	1998	South Atlantic	0.0426	0.0515	0.2638
P-Value			[1]	[1]	[1]
Kansas	1998	West North Central	-0.0178	-0.0347	0.1865
P-Value			[1]	[1]	[0.6667]
Minnesota	1998	West North Central	-0.0017	-0.0154	-0.0189
P-Value			[1]	[0.6667]	[0.6667]
Missouri	1998	West North Central	0.0066	-0.0037	0.1995
P-Value			[1]	[1]	[0.6667]
Nebraska	1998	West North Central	0.001	0.0076	0.1993
P-Value			[0.3333]	[0.3333]	[0.6667]
North Dakota	1998	West North Central	0.0164	0.0165	0.2363
P-Value			[0.6667]	[0.6667]	[1]
South Dakota	1998	West North Central	0.0062	0.0062	0.2275
P-Value			[1]	[1]	[1]
Illinois	1998	East North Central	-0.0261	-0.0261	0.1951
P-Value			[1]	[1]	[0.6667]
Illinois [a]	2006	East North Central	-0.0301	-0.0202*	-0.0258*
P-Value			[0.1212]	[0.0606]	[0.0606]
Indiana	1998	East North Central	0.0013	-0.0007	0.1812
P-Value			[1]	[1]	[0.6667]
Michigan	1998	East North Central	-0.0235	-0.0235	0.1977
P-Value			[1]	[1]	[0.6667]
Ohio	1998	East North Central	-0.0179	-0.0179	0.2034
P-Value			[1]	[1]	[1]
Wisconsin	1998	East North Central	-0.002	-0.0038	-0.0157
P-Value			[0.6667]	[1]	[0.3333]
New York [a]	1998	Middle Atlantic	0.0382	0.047	0.0382
P-Value			[1]	[0.6667]	[1]
New York [a]	2006	Middle Atlantic	-0.0069	-0.0043	0.0139
P-Value			[0.2424]	[0.9394]	[0.8182]
Pennsylvania [a]	1998	Middle Atlantic	-0.0148	-0.0148	0.2064
P-Value			[1]	[1]	[1]
Connecticut	1998	New England	-0.0356	-0.0262	0.1857
P-Value			[0.6667]	[0.6667]	[1]
Maine	1998	New England	-0.0301	-0.03	0.1851
P-Value			[0.6667]	[0.6667]	[0.6667]

State	Treatment Year	Division	Match on Poverty Rate in Each Pre-Treat Year	Match on Dube's Preferred Controls	Match on Mean Pre-Treat Poverty Rate, Macro & Policies
Maine [a]	2003	New England	0.0179	0.0112	0.0361*
P-Value			[0.3415]	[0.2927]	[0.0732]
Massachusetts	1997	New England	0.016	0.0163	0.2033
P-Value			[0.3333]	[0.3333]	[0.6667]
New Hampshire	1998	New England	0.0071	0.0071	0.1854
P-Value			[1]	[1]	[0.6667]
Rhode Island	1998	New England	0.0127	0.0098	0.2135
P-Value			[1]	[1]	[1]
Rhode Island [a]	2005	New England	0.0054	-0.0023	0.0204
P-Value			[0.4286]	[0.7714]	[0.3429]
Vermont	2002	New England	0.0049	0.0049	0.0049
P-Value			[0.3333]	[0.3333]	[0.3333]

Notes: P-values are reported in [brackets]. Dube's preferred controls include pre- and post- treatment trend of GDP and unemployment rate. Macro trends include pre- and post- treatment trend of housing price index, unemployment rate, and wage among high education. Social trends include pre- and post- treatment trend of EITC and TANF benefit.

[a] States with at least one donor states within the same census division and outside.

Appendix Table 7. Difference-in-Differences Estimates of the Effect of Prominent Minimum Wage Increases on Poverty

	$0.75 MW Increase	$1 MW Increase	$0.50 MW Increase	$0.25 MW Increase
	Panel I: 1983-2012, Callaway and Sant'Anna (2021) Estimates			
Minimum Wage	0.0061	0.0021	-0.0048	-0.0105
	(0.0081)	(0.0049)	(0.0060)	(0.0091)
Δ in Prob of Poverty from Prominent MW	*[0.0466]*	*[0.0161]*	*[-0.0363]*	*[-0.0788]*
	Panel II: 2010-2019, Callaway and Sant'Anna (2021) Estimates			
Minimum Wage	0.0030	0.0023	-0.0036	-0.0031
	(0.0073)	(0.0081)	(0.0055)	(0.0046)
Δ in Prob of Poverty from Prominent MW	*[0.0229]*	*[0.0182]*	*[-0.0278]*	*[-0.0237]*
	Panel III: 1983-2019, Callaway and Sant'Anna (2021) Estimates			
Minimum Wage	0.0019	-0.0001	-0.0048	-0.0105
	(0.0051)	(0.0042)	(0.0064)	(0.0086)
Δ in Prob of Poverty from Prominent MW	*[0.0146]*	*[-0.0007]*	*[-0.0363]*	*[-0.0789]*

***Significant at 1% level **at 5% level *at 10% level

Note:. Estimated average effect of the treatment on the treated are obtained using Callaway and Sant'Anna (2021) estimates, which rely on not-yet-adopters of minimum wage increases as counterfactuals. All estimates include controls for HPI. Estimates in columns (1), (2) and (3) consider a control state treated in the period when it adopts a minimum wage increase of $0.25 or greater. For column (4), a control state is considered treated when it adopts a minimum wage increase of $0.10 or greater.

Appendix Table 8. Sensitivity of Estimated Long-Run Poverty Effects to Definition of Poverty, 1983-2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
INR<0.5	0.0052	0.0058	0.0032	0.0013	0.0878***	0.0083	0.0315	0.0140
	(0.0106)	(0.0094)	(0.0082)	(0.0150)	(0.0280)	(0.0287)	(0.0360)	(0.0233)
Elasticity	[0.0945]	[0.1128]	[0.0750]	[0.0178]	[0.9457]	[0.0791]	[0.2808]	[0.1569]
INR<1.0	-0.0115	-0.0069	-0.0057	-0.0324	0.1270**	-0.0561*	-0.0170	-0.0244
	(0.0167)	(0.0164)	(0.0156)	(0.0233)	(0.0578)	(0.0294)	(0.0487)	(0.0257)
Elasticity	[-0.0881]	[-0.0545]	[-0.0546]	[-0.1847]	[0.6187]	[-0.2441]	[-0.0658]	[-0.1206]
INR<1.5	0.0252	0.0260	0.0238	0.0136	0.1710***	0.0128	-0.0018	0.0327
	(0.0167)	(0.0159)	(0.0174)	(0.0221)	(0.0598)	(0.0315)	(0.0433)	(0.0266)
Elasticity	[0.1182]	[0.1200]	[0.1340]	[0.0482]	[0.5388]	[0.0370]	[-0.0046]	[0.1039]
N	4,662,781	5,238,862	3,332,535	3,019,445	262,481	965,820	1,211,366	1,330,242

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2013 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four.

Appendix Table 9. Callaway-Sant'Anna (2021) Estimates of the Effect of Prominent Minimum Wage Increases on Poverty, 2010-2019

	(1)	(2)	(3)
	$0.75 Minimum Wage Increase	*$1 Minimum Wage Increase*	*$0.50 Minimum Wage Increase*
	Panel I: Restricted Control Group		
Minimum Wage	-0.0007	0.0004	-0.0042
	(0.005)	(0.0066)	(0.0055)
Δ in Prob of Poverty from MW	[-0.0051]	[-0.0029]	[-0.0304]
	Panel II: Expanded Control Group, Controlling for Smaller Minimum Wage		
Minimum Wage	-0.0022	-0.0017	-0.0039
	(0.0046)	(0.0053)	(0.0057)
Δ in Prob of Poverty from MW	[-0.0163]	[-0.0126]	[-0.0284]

***Significant at 1% level **at 5% level *at 10% level

Note: Data used to generate estimates are from the March 2011 through March 2020 CPS. Estimates are generated using Callaway & Sant'Anna estimator, controlling for the state house price index. Restricted control group includes states without any minimum wage increases between 2010 and 2019 and expanded control group includes states without any prominent minimum wage increases between 2010 and 2019. Column (1), Panel II includes controls for smaller minimum wage increases between $0.25 and $0.74 per hour; column (2), Panel II includes controls for smaller minimum wage increases between $0.25 and $0.99 per hour, and column (3), Panel II includes controls for smaller minimum wage increases between $0.25 and $0.49 per hour. Bootstrapped standard errors are reported inside the parenthesis.

Appendix Table 10. Sensitivity of Poverty Estimates to Use of Supplemental Poverty Measure (SPM), 2010-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
	Panel I: Contemporaneous Effects							
Minimum Wage	-0.0073	-0.0060	-0.0109	-0.0102	0.0019	-0.0486	-0.0404	-0.0046
	(0.0199)	(0.0183)	(0.0177)	(0.0329)	(0.0710)	(0.0369)	(0.0409)	(0.0294)
Elasticity	[-0.0497]	[-0.0407]	[-0.0774]	[-0.0544]	[0.0095]	[-0.1841]	[-0.1725]	[-0.0283]
	Panel II: Long-Run Effects							
Minimum Wage	0.000	0.0046	-0.0065	-0.0030	0.0823	0.0069	-0.0259	0.0112
	(0.019)	(0.0174)	(0.0179)	(0.0340)	(0.1238)	(0.0549)	(0.0506)	(0.0324)
Elasticity	[0.002]	[0.032]	[-0.046]	[-0.016]	[0.416]	[0.026]	[-0.111]	[0.069]
N	1,839,014	2,103,337	1,331,655	1,079,397	101,281	98,413	576,360	507,359

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.

Appendix Table 11. Sensitivity of Estimates of Effect of Minimum Wages on Poverty in Post-Great Recession Era (2010-2019) to Use of Higher Income-to-Needs Cutoffs to Define Poverty and Use of Continuous Income-to-Needs Ratio

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
	Panel I: "Contemporaneous" Effects Using Family as Resource Sharing Unit							
INR<2.0	0.0238	0.0231	0.0095	0.0269	0.0514	0.0397	0.0290	0.0522
	(0.0272)	(0.0235)	(0.0232)	(0.0395)	(0.0565)	(0.0443)	(0.0472)	(0.0403)
Elasticity	*[0.0750]*	*[0.0727]*	*[0.0332]*	*[0.0642]*	*[0.1256]*	*[0.0657]*	*[0.0598]*	*[0.1248]*
INR<3.0	0.0105	0.0150	0.0009	0.0100	0.0488	-0.0171	0.0086	0.0242
	(0.0216)	(0.0201)	(0.0196)	(0.0273)	(0.0478)	(0.0275)	(0.0360)	(0.0305)
Elasticity	*[0.0221]*	*[0.0314]*	*[0.0021]*	*[0.0168]*	*[0.0846]*	*[-0.0223]*	*[0.0129]*	*[0.0416]*
Continuous INR	0.2749	0.2344	0.3532	0.0961	0.2086	0.1546	-0.0293	0.1229
	(0.2157)	(0.1864)	(0.2584)	(0.1624)	(0.3877)	(0.1969)	(0.1785)	(0.2132)
Elasticity	*[0.4522]*	*[0.3835]*	*[0.6121]*	*[0.1327]*	*[0.2977]*	*[0.1781]*	*[-0.0374]*	*[0.1741]*
	Panel II: "Long-Run" Effects Using Family as Resource Sharing Unit							
INR<2.0	0.0008	0.0021	-0.0171	-0.0079	0.0420	0.0227	-0.0201	0.0417
	(0.0235)	(0.0199)	(0.0217)	(0.0370)	(0.0603)	(0.0500)	(0.0530)	(0.0351)
Elasticity	*[0.0025]*	*[0.0066]*	*[-0.0598]*	[-0.0188]	*[0.1026]*	*[0.0375]*	*[-0.0416]*	*[0.0996]*
INR<3.0	-0.0100	0.0024	-0.0281	-0.0133	-0.0096	-0.0349	-0.0009	0.0313
	(0.0196)	(0.0182)	(0.0186)	(0.0285)	(0.0662)	(0.0368)	(0.0398)	(0.0282)
Elasticity	*[-0.0210]*	*[0.0050]*	*[-0.0635]*	[-0.0223]	*[-0.0166]*	*[-0.0453]*	*[-0.0013]*	*[0.0538]*
Continuous INR	0.3148	0.2550	0.4211	0.1703	0.1241	0.0496	0.1158	0.0667
	(0.2373)	(0.2165)	(0.2829)	(0.2494)	(0.4427)	(0.2858)	(0.3015)	(0.2532)
Elasticity	*[0.5178]*	*[0.4171]*	*[0.7298]*	[0.2352]	*[0.1771]*	*[0.0571]*	*[0.1480]*	*[0.0945]*

	Panel III: "Longer-Run" Effects Using Household as Resource Sharing Unit							
INR<2.0	0.0068	0.0055	-0.0072	-0.0078	0.0357	-0.0005	-0.0228	0.0382
	(0.0256)	(0.0218)	(0.0251)	(0.0373)	(0.0692)	(0.0433)	(0.0529)	(0.0355)
Elasticity	*[0.0234]*	*[0.0188]*	*[-0.0283]*	[-0.0198]	*[0.0926]*	*[-0.0010]*	*[-0.0496]*	*[0.0938]*
INR<3.0	-0.0037	0.0083	-0.0183	-0.0189	-0.0337	0.0125	-0.0124	0.0300
	(0.0213)	(0.0197)	(0.0218)	(0.0290)	(0.0887)	(0.0362)	(0.0421)	(0.0291)
Elasticity	*[-0.0082]*	*[0.0181]*	*[-0.0446]*	[-0.0329]	*[-0.0603]*	*[0.0173]*	*[-0.0194]*	*[0.0520]*
Continuous INR	0.4040	0.3332	0.5383	0.1836	0.1380	0.0323	0.1723	0.0306
	(0.2627)	(0.2371)	(0.3201)	(0.2577)	(0.4501)	(0.3191)	(0.3023)	(0.2641)
Elasticity	*[0.6890]*	*[0.5632]*	*[0.9805]*	[0.2584]	*[0.2002]*	*[0.0389]*	*[0.2252]*	*[0.0434]*
N	1,651,463	1,893,930	1,197,322	965,087	90,214	88,059	520,275	454,141

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS household weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansion.

Appendix Table 12. Robustness of Table 9 Estimates to Alternate Definitions of Poverty, 2010-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-Elderly, < 65	*All Ages, Including Elderly*	*Working Age Adults, Ages 16-64*	*≤ HS Degree, Ages <65*	*< HS Degree, Ages 16-24*	*Single Mothers*	*Black or Hispanic, < 65*	*Children Under Age 16*
INR<0.5	-0.0094	-0.0083	-0.0065	-0.0106	-0.0085	0.0032	-0.0224	-0.0206
	(0.0079)	(0.0072)	(0.0073)	(0.0117)	(0.0212)	(0.0305)	(0.0173)	(0.0157)
Elasticity	*[-0.1417]*	*[-0.1372]*	*[-0.1111]*	[-0.1229]	*[-0.0907]*	*[0.0179]*	*[-0.2198]*	*[-0.2311]*
INR<1.0	-0.0170	-0.0161	-0.0167	-0.0236	-0.0038	0.0220	-0.0234	-0.0229
	(0.0160)	(0.0137)	(0.0145)	(0.0221)	(0.0472)	(0.0350)	(0.0310)	(0.0248)
Elasticity	*[-0.1185]*	*[-0.1186]*	*[-0.1325]*	[-0.1216]	*[-0.0194]*	*[0.0658]*	*[-0.1010]*	*[-0.1148]*
INR<1.5	-0.0107	-0.0047	-0.0164	-0.0119	-0.0303	0.0187	-0.0128	0.0020
	(0.0206)	(0.0184)	(0.0187)	(0.0297)	(0.0579)	(0.0395)	(0.0373)	(0.0321)
Elasticity	*[-0.0462]*	*[-0.0208]*	*[-0.0802]*	[-0.0385]	*[-0.0987]*	*[0.0390]*	*[-0.0350]*	*[0.0065]*
INR<2.0	0.0075	0.0097	-0.0036	0.0176	0.0134	0.0582	0.0063	0.0376
	(0.0235)	(0.0209)	(0.0195)	(0.0348)	(0.0500)	(0.0401)	(0.0464)	(0.0391)
Elasticity	*[0.0237]*	*[0.0305]*	*[-0.0126]*	[0.0420]	*[0.0328]*	*[0.0963]*	*[0.0131]*	*[0.0898]*
INR<3.0	-0.0119	-0.0053	-0.0208	-0.0053	0.0237	-0.0223	-0.0063	0.0100
	(0.0192)	(0.0188)	(0.0166)	(0.0285)	(0.0406)	(0.0291)	(0.0393)	(0.0320)
Elasticity	*[-0.0251]*	*[-0.0110]*	*[-0.0470]*	[-0.0089]	*[0.0411]*	*[-0.0290]*	*[-0.0095]*	*[0.0171]*
N	1,651,463	1,893,930	1,197,322	965,087	90,214	88,059	520,275	454,141

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 2011 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for, indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families.

Appendix Table 13. Assessing "Close Controls" Using a Synthetic Control Approach, 1983-2019

	Proportion of weight on states in same division					
	Match on Poverty Rate in Each Pre-Treat Year	Match on Mean Pre-Treat Poverty Rate & Preferred Macro Trends	Match on Mean Pre-Treat Poverty Rate & Dube's Macro Trends	Match on Mean Pre-Treat Poverty Rate, Preferred Macro Trends, & Policies	Average number of donor states	Average number of donor states in same division
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel I: $0.75 Minimum Wage Increase					
East North Central	0.018	0.157	0.000	0.056	39.000	3.000
Middle Atlantic	0.011	0.000	0.000	0.000	35.500	1.000
Mountain	0.056	0.052	0.000	0.033	29.000	6.000
New England	0.141	0.159	0.221	0.162	23.800	3.533
Pacific	0.165	0.126	0.175	0.075	17.625	2.000
South Atlantic	0.007	0.039	0.005	0.018	37.440	5.640
West North Central	0.002	0.103	0.139	0.078	34.250	4.000
West South Central	0.008	0.223	0.000	0.154	29.000	3.000
	Panel II: $1.00 Minimum Wage Increase					
East North Central	0.018	0.157	0.000	0.056	39.000	3.000
Middle Atlantic	0.000	0.000	0.000	0.000	37.000	1.000
Mountain	0.026	0.064	0.000	0.010	29.000	6.000
New England	0.163	0.123	0.182	0.165	26.538	3.769
Pacific	0.003	0.000	0.045	0.000	38.000	1.667
South Atlantic	0.023	0.056	0.004	0.044	27.429	3.857
West North Central	0.002	0.159	0.185	0.103	33.000	4.000

	Proportion of weight on states in same division				Average number of donor states	Average number of donor states in same division
	Match on Poverty Rate in Each Pre-Treat Year	Match on Mean Pre-Treat Poverty Rate & Preferred Macro Trends	Match on Mean Pre-Treat Poverty Rate & Dube's Macro Trends	Match on Mean Pre-Treat Poverty Rate, Preferred Macro Trends, & Policies		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel III: $0.50 Minimum Wage Increase					
East North Central	0.017	0.000	0.000	0.000	32.000	2.000
Middle Atlantic	0.007	0.167	0.034	0.167	18.667	1.000
Mountain	0.056	0.050	0.000	0.038	28.000	6.000
New England	0.163	0.281	0.071	0.341	28.889	1.444
Pacific	0.320	0.323	0.295	0.000	12.500	1.250
South Atlantic	0.004	0.057	0.005	0.044	30.800	5.400
West North Central	0.059	0.114	0.147	0.100	26.000	3.800
West South Central	0.128	0.063	0.000	0.086	28.000	3.000

Notes: Data used to generate estimates are from the March 1984 to March 2019 CPS Weights are generated using synthetic control estimate. Donor pool is comprised of states without a minimum wage increase, 3 years before the treatment, during the treatment year, and 1 year after the treatment. Preferred macro trends include pre- and post- treatment trend of housing price index, unemployment rate, and wage among high education. Dube's macro trends include pre- and post-treatment trend of unemployment rate and per capita income. Social trends include pre- and post- treatment trend of EITC and TANF benefit.

Appendix Table 14. Synthetic Control Matched Difference-in-Differences Estimates of the Effect of Prominent Minimum Wage Increases on Poverty, 1983-2019

	(1)	(2)	(3)	(4)
	$0.75 MW Increase	$1.00 MW Increase	$0.50 MW Increase	$0.25 MW Increase
	Panel I: Expanded Donor Pool: At Least One Donor State Available			
Minimum Wage	0.0012	0.005	0.0025	0.0045
p-value	{0.19}	{0.143}	{0.281}	{0.226}
Δ in Prob of Poverty from MW	[0.009]	[0.037]	[0.019]	[0.034]
Maximum MW in Controls	$0.50	$0.50	$0.25	$0.10
	Panel II: Expanded Donor Pool: At Least One Donor State Available			
Minimum Wage	0.0014	0.0057	0.004*	0.0045
p-value	{0.219}	{0.1}	{0.057}	{0.226}
Δ in Prob of Poverty from MW	[0.01]	[0.043]	[0.03]	[0.034]
Maximum MW in Controls	$0.35	$0.35	$0.10	$0.05

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2019 CPS. All regressions include treatment state and year fixed effects. P-values generated from wild cluster bootstrapping are reported inside the curly brackets. Restricted treatment sample (panels I and II) includes only states where there are at least one donor states within the same census division and outside the census division. Expanded treatment sample (panels III and IV) includes all states where there is at least one donor state, inside or outside of the census division.

Appendix Table 15. Sensitivity of Estimated Poverty Effects of Minimum Wage to Inclusion of Dube's preferred macroeconomic controls and Controls for Spatial Heterogeneity, Using INR < 1.5, 1983-2019

	(1)	(2)	(3)	(4)	(5)	(6)
	Resource Sharing Unit: Family			Resource Sharing Unit: Household		
	Panel I: Dube (2019) Model and Macroeconomic Controls					
Minimum Wage	-0.0079	-0.0122	-0.0171	-0.0096	-0.0096	-0.0159
	(0.0154)	(0.0167)	(0.0168)	(0.0138)	(0.0146)	(0.0157)
Elasticity	[-0.035]	[-0.054]	[-0.076]	[-0.043]	[-0.043]	[-0.071]
	Panel II: Preferred (BMS) Model					
Minimum Wage	0.0221	0.0259	0.0159	0.0233	0.0271	0.0183
	(0.0154)	(0.0159)	(0.0138)	(0.0157)	(0.0162)	(0.0139)
Elasticity	[0.098]	[0.1150]	[0.0705]	[0.1035]	[0.1204]	[0.0814]
	5,774,313	5,774,313	5,774,313	5,774,984	5,774,984	5,774,984
Great Recession State Dummies	N	Y	N	N	Y	N
State-Specific Linear Time Trend	N	N	Y	N	N	Y

***Significant at 1% level **at 5% level *at 10% level

Notes: Data used to generate estimates are from the March 1984 to March 2020 CPS. All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, cubic in age. The Dube model includes GDP per capita, EITC supplement, and unemployment rate. The Burkhauser, McNichols, and Sabia (BMS) model includes maximum Temporary Assistance for Needy Families (TANF), Earned Income Tax Credit (EITC) refundable rate, Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions, and housing price index. It also does not disaggregate sub-families from primary families.

Appendix Table 16. Wage Distribution of All Workers by Income-to-Needs Ratio of Their Families, March 2019 and 2020 CPS

Income-to-Needs Ratio	Hourly Wage Categories[a]									
	$0.01 to $6.99	$7.00 to $7.24	$7.25 to $10.99	$11.00 to $14.99	$15.00 to $19.99	$20.00 and over	Total	Percent of All Workers	Percent of Workers Earning More than $6.99 and Less Than $11.00	Percent of Workers Earning More than $6.99 and Less Than $15.00
Panel I: March 2019 CPS										
Less than 1.00	5.16	0.61	31.88	33.88	17.27	11.21	100.00	4.86	11.49	8.24
1.00 to 1.24	3.31	0.49	21.31	35.70	21.96	17.23	100.00	2.78	4.61	4.40
1.25 to 1.49	4.50	0.00	24.29	37.32	18.82	15.08	100.00	2.88	6.18	5.42
1.50 to 1.99	2.18	0.10	19.55	34.50	26.37	17.30	100.00	7.60	13.84	13.85
2.00 to 2.99	1.49	0.21	13.38	28.00	28.87	28.05	100.00	15.83	18.97	21.48
3.00 or above	1.01	0.12	6.64	12.48	18.56	61.19	100.00	66.05	44.91	46.61
Whole Category Share[b]	1.46	0.15	10.25	18.26	20.65	49.22	100.00	100.00	100.00	100.00
Panel II: March 2020 CPS										
Less than 1.00	4.50	0.00	30.31	27.06	22.13	16.00	100.00	4.25	12.39	7.64
1.00 to 1.24	2.79	0.00	17.22	41.70	25.75	12.55	100.00	2.35	4.17	4.43
1.25 to 1.49	5.56	0.26	21.13	34.22	21.08	17.75	100.00	2.63	6.50	5.33
1.50 to 1.99	2.49	0.22	13.86	36.01	23.56	23.86	100.00	7.02	11.78	12.81
2.00 to 2.99	1.84	0.18	9.86	24.79	30.27	33.06	100.00	14.48	18.04	20.42
3.00 or above	1.21	0.09	5.08	12.39	16.43	64.80	100.00	69.28	47.12	49.37
Whole Category Share[b]	1.63	0.11	7.82	17.33	19.40	53.71	100.00	100.00	100.00	100.00

Notes:

[a]Hourly wage rates are based on a direct question concerning earnings per hour on their current primary job. All income data used to calculate income-to-needs ratios come from retrospective information from the previous year because that is the period for which it is reported. The sample is restricted to those who report employment for at least 10 weeks last year for at least 10 hours per week (steady employment).

[b]Share of all workers with wage earnings in each category

Source: Estimated from the outgoing rotation group of the Current Population Survey, March 2019-2020.

Appendix Table 17. Sensitivity of Estimates to Omitting March 2020 Survey Due to COVID-19 Interruptions/Sampling Concerns, Non-Elderly Individuals, 1983-2018

	(1)	(2)
Resource Sharing Unit	*Individual*	*Family*
INR<0.5	0.0010	0.0014
	(0.0058)	(0.0050)
Elasticity	[0.0159]	[0.0238]
INR<1.0	-0.0037	-0.0033
	(0.0082)	(0.0075)
Elasticity	[-0.0269]	[-0.0240]
INR<1.5	0.0166	0.0166
	(0.0103)	(0.0107)
Elasticity	[0.0739]	[0.0737]
N	5,641,796	5,642,467

***Significant at 1% level **at 5% level *at 10% level

Notes: All regressions include state and year fixed effects and are weighted using the CPS person weight. Standard errors are clustered at the state level. All models also include controls for indicators for non-Hispanic white, Black, Hispanic, and gender, marital status, family size, number of children, educational attainment, a cubic in age, housing price index, unemployment rate and wage rate for those with a college degree or higher, the Earned Income Tax Credit (EITC) refundable rate, maximum Temporary Assistance for Needy Families (TANF) and Supplemental Nutrition Assistance Program (SNAP) benefits for family of four, and Affordable Care Act Medicaid expansions.